

BY

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CIN OF THE UNITED STATES NATIONAL MUSEUM
ISSUED January 7, 1913.

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of two series, the *Proceedings* and the *Bulletins*.
Proceedings, the first volume of which was issued primarily as a medium for the publication of brief, papers based on the collections of the Museum, presenting newly acquired facts in zoology, entomology, including descriptions of new forms or subspecies of limited groups. One or two volumes are usually distributed to libraries and scientific organizations, a number of copies of each paper, in pamphlet form, being sent to specialists and others interested in the different groups as printed. The date of publication is printed on the title page, and these dates are also recorded in the table of contents.

Bulletins, the first of which was issued in 1876, consists of separate publications comprising chiefly monographs of zoological groups and other general systematic treatises (usually in several volumes), faunal works, reports on expeditions, catalogues of type-specimens, special collections, &c. Most of the volumes are octavos, but a quarto size has been used in a few instances in which large plates were regarded as necessary.

From 1902 a series of octavo volumes containing papers on botanical collections of the Museum, and known as *Notes from the National Herbarium*, has been published. The present work forms No. 97 of the *Bulletin* series.

earches
gments
n of terms and abbreviations used
id or catometopous crabs of America
discussion
neplacidae
hily Carcinoplacinae
nus Trizocarcinus
<i>Trizocarcinus dentatus</i>
nus Bathyplax
<i>Bathyplax typhla</i>
nus Pilumnoplax
<i>Pilumnoplax americana</i>
<i>elata</i>
hily Goneplacinae
nus Goneplax
<i>Goneplax barbata</i>
<i>sigsbei</i>
<i>rosaea</i>
<i>hirsuta</i>
<i>tridentata</i>
hily Prionoplacinae
nus Prionoplax
<i>Prionoplax atlantica</i>
<i>ciliata</i>
nus Tetraplax
<i>Tetraplax quadridentata</i>
nus Euryplax
<i>Euryplax nitida</i>
<i>polita</i>
nus Chasmophora

Chasmocarcinus
asmocarcinus typicus
 latipes
 obliquus
 cylindricus

Meridae.

Pinnotherinae

Pinnotheres

anthonomus ostreum

Vareini.

holmes.

geddesi.

politus. .

angelicum

lithodome

maculatu

bipuncta

depressu

muliniar

nugetterm

pugnac
pudus

HEDUS . .
—
gomei

serre...
— 1 —

concharu

pubescent

barbatus

strombi.

silvestrii

margarit

reticulate

moseri.

shoemak

<i>schuberti</i>
<i>alcocki</i>
<i>calmani</i>
Family <i>Pinnothereliinae</i>
Genus <i>Pinnixa</i>
<i>Pinnixa transversalis</i>
<i>faxoni</i>
<i>cristata</i>
<i>patagoniensis</i>
<i>monodactyla</i>
<i>longipes</i>
<i>floridana</i>
<i>retinens</i>
<i>tomentosa</i>
<i>faba</i>
<i>littoralis</i>
<i>barnharti</i>
<i>minuta</i>
<i>chaetopterana</i>
<i>valdiviensis</i>
<i>occidentalis</i>
<i>sayana</i>
<i>cylindrica</i>
<i>franciscana</i>
<i>schmitti</i>
<i>hiatus</i>
<i>tubicola</i>
<i>weymouthi</i>
<i>affinis</i>
<i>brevipollex</i>
Genus <i>Scleropanax</i>
<i>Scleropanax</i>

<i>balanensis</i>
<i>isthmia</i>
<i>dentata</i>
<i>obesa</i>
<i>tuberculata</i>
<i>sica</i>
<i>angusta</i>
<i>depressa</i>
<i>fragilis</i>
<i>cursor</i>
<i>gracilis</i>
<i>floridana</i>
<i>gracilipes</i>
<i>acutifrons</i>
<i>dae</i>
<i>Grapsinae</i>
<i>Grapsus</i>
<i>grapsus grapsus</i>
<i>Geograpsus</i>
<i>eograpsus lividus</i>
<i>Leptograpsus</i>
<i>Leptograpsus variegatus</i>
<i>Goniopsis</i>
<i>Goniopsis cruentata</i>
	<i>pulchra</i>
<i>Pachygrapsus</i>
<i>Pachygrapsus crassipes</i>
	<i>maurus</i>
	<i>transversus</i>
	<i>gracilis</i>
	<i>marmoratus</i>

<i>Platychirograpsus impressus</i>	<i>jamaicensis</i>
<i>Platychirograpsus</i>	
<i>Euchirograpsus</i>	
<i>Euchirograpsus americanus</i>	
<i>Sesarminae</i>	
<i>Sesarma</i>	
Subgenus Chiromantes	
<i>Sesarma africanum</i>	
Subgenus Sesarma	
<i>Sesarma verleyi</i>	
<i>sulcatum</i>	
<i>reticulatum</i>	
<i>aequatoriale</i>	
<i>curacaoense</i>	
<i>rhizophorae</i>	
<i>crassipes</i>	
<i>bidentatum</i>	
<i>jarvisi</i>	
<i>ophioderma</i>	
<i>barbimanum</i>	
Subgenus Holometopus	
<i>Sesarma rectum</i>	
<i>occidentale</i>	
<i>cinereum</i>	
<i>miersii</i>	
<i>miersii iheringi</i>	
<i>magdalenense</i>	
<i>biolleyi</i>	
<i>tampicense</i>	

y <i>Plagusinae</i>	
<i>Plagusia</i>	
<i>Plagusia depressa</i>	
<i>depressa tuberculata</i>	
<i>immaculata</i>	
<i>chabrus</i>	
<i>Percnon</i>	
<i>Percnon gibbesi</i>	
<i>Cydnidae</i>	
<i>Cardisoma</i>	
<i>Cardisoma guanhumi</i>	
<i>crassum</i>	
<i>Ucides</i>	
<i>Ucides cordatus</i>	
<i>occidentalis</i>	
<i>Gecarcinus</i>	
<i>Gecarcinus ruricola</i>	
<i>lateralis</i>	
<i>quadratus</i>	
<i>planatus</i>	
<i>lagostoma</i>	
<i>Gecarcoidea</i>	
<i>Gecarcoidea lalandii</i>	
<i>Ocypodidae</i>	
y <i>Ocypodinae</i>	
<i>Ocypode</i>	
<i>Ocypode albicans</i>	
<i>occidentalis</i>	
<i>gaudichaudii</i>	
<i>Uca</i>	
<i>Uca maracoani</i>	
<i>monilifera</i>	

<i>helleri</i>
<i>stenodactylus</i>
<i>musica</i>
<i>subcylindrica</i>
<i>festae</i>
<i>leptodactyla</i>
<i>latimanus</i>
Macrophthalminae
Euplax
<i>euplax leptophthalma</i>
<i>plates</i>

-
matic ventral view of a grapsoid crab, showing the termin-
ation.....
Minus dentatus, ventral view of left side of carapace of ma-
le, showing stridulating ridge, $\times 4$
X. typhla, male (9729). *a*, Outer maxillipeds, showing app-
 $\times 4$; *b*, abdomen and part of sternum, $\times 3$; *c*, left chela, \times
Plax americana, male, station 62, dorsal view, $\times 1\frac{1}{2}$
Plax americana, male, station 62, anterior portion of ca-
bil from before, $\times 3\frac{1}{2}$
P. hirsuta, cotype, $\times 2\frac{1}{2}$. *a*, Dorsal view; *b*, right chela and
view. (After Borradaile.).....
Plax atlantica, male, holotype. *a*, Abdomen and part of sternum;
outer maxilliped, dotted line marking median axis, $\times 12$
P. quadridentata, male (24564), outer maxillipeds, showing
them, $\times 8$
P. quadridentata, male (24564), abdomen, part of sternum, a
leg, $\times 6\frac{1}{2}$
P. nitida, male (15012). *a*, Abdomen and part of sternum;
outer maxilliped, dotted line marking median axis, $\times 5\frac{1}{2}$
Phora macrophthalma, female holotype. *a*, Carapace, eyes,
, dorsal view, $\times 5\frac{1}{2}$; *b*, right chela, outer view, $\times 7\frac{1}{2}$
Phora macrophthalma, anterior view of orbit of female holotyp-
e, in which lies the antennal flagellum, \times about 13....
Plonus granulimanus, male holotype. *a*, Abdomen and par-
 $\times 3$; *b*, outer maxillipeds, showing approximation, $\times 5\frac{1}{2}$
Plonus granulimanus, male holotype, right chela, outer view
Plonus californiensis, male (32966). *a*, Outer maxilliped, do-
ing median axis, $\times 4\frac{1}{2}$; *b*, abdomen and part of sternum, \times
Combila octodentata, male holotype. *a*, Right chela, out-
. abdomen, part of sternum, and coxa of last leg, $\times 1\frac{1}{2}$

- $\times 6\frac{1}{2}$
es ostreum, outer maxilliped of female (2542), $\times 15\frac{1}{2}$
es holmesi, outer maxilliped of female holotype, $\times 15\frac{1}{2}$
es geddesi, female (23767). *a*, Chela, $\times 16$; *b*, outer maxilliped, enlarged. (After Holmes.)
es politus, outer maxilliped of female (40448), $\times 50$
es angelicus, outer maxilliped of female (17467), $\times 15\frac{1}{2}$
es maculatus, male, $\times 8$. (After Smith.)
es maculatus, outer maxilliped of female (36782), $\times 10$
es depressus, outer maxilliped of male (48594), $\times 137\frac{1}{2}$
es muliniarum, outer maxilliped of male holotype, $\times 90$
es pugettensis, endognath of outer maxilliped of female (40390), $\times 20$
es nudus, female holotype. *a*, Carapace, slightly enlarged; *c*, outer maxilliped; *d*, left cheliped; *e*, first leg. (After Holmes.)
es serrei, outer maxilliped of female (48571), $\times 20$
es concharum, endognath of outer maxilliped of male (23929), $\times 20$
es pubescens, female holotype. *a*, General outline, $\times 10$; *b*, area. (After Holmes.)
es barbatus (23435). *a*, Endognath of outer maxilliped of female, abdomen of male, $\times 7\frac{1}{2}$
es strombi, endognath of outer maxilliped of female holotype, enlarged.
es reticulatus, outer maxilliped of female holotype, $\times 15\frac{1}{2}$
es moseri, endognath of outer maxilliped of female holotype, $\times 15\frac{1}{2}$
es shoemakeri, endognath of outer maxilliped of male holotype, $\times 15\frac{1}{2}$
es taylori, endognath of outer maxilliped of male (40397), $\times 20$
es orcutti, endognath of outer maxilliped of male holotype, $\times 15\frac{1}{2}$
es hemphilli, outer maxilliped of male holotype, $\times 110$
es guerini, outer maxilliped of holotype, enlarged. (After Holmes.)

- ylus encopei*, male (23430). *a*, Outline of carapace, $\times 6$; 16; *c*, endognath of outer maxilliped, $\times 48$; *d*, fourth leg, *a*, $\times 16$
- ylus borradoilei*, female (49231). *a*, Outer maxilliped, $\times 11$
- ylus stebbingi*, outer maxilliped of male holotype, $\times 63$
- ylus alcorki*, outer maxilliped of female holotype, $\times 73$
- ylus alcocki*, leg of male paratype, $\times 16$
- ylus calmani*, outer maxilliped of female (48570), $\times 50$
- ylus calmani*. *a*, Last right leg of female holotype, $\times 1$ of male (50168), $\times 12$
- transversalis*, outer maxilliped of female (40446), $\times 16\frac{1}{2}$
- transversalis*. *a*, Abdomen of male, enlarged; *b*, right chela. (After Faxon).
- transversalis*, abdomen and sternum of male, enlarged (Edwards and Lucas).
- fazoni* (7639) $\times 13\frac{3}{4}$. *a*, Abdomen of male; *b*, outer maxilliped of female holotype, $\times 15$
- cristata*, outer maxilliped of female holotype, $\times 15$
- patagoniensis*, male holotype. *a*, Outer maxilliped, $\times 1$, $\times 7\frac{1}{2}$
- longipes*, cotype, general outline, enlarged. (After Holm).
- longipes*, cotype, outer maxilliped, enlarged. (After Holm).
- floridana*. *a*, Abdomen of male (49249), $\times 19$; *b*, outer maxilliped of male paratype (6696), $\times 19$
- retinens*, endognath of outer maxilliped of male holotype, $\times 48$
- retinens*, male holotype, $\times 12$. *a*, Abdomen; *b*, third leg; *c*, left chela.
- tomentosa*, outer maxilliped of female (29948), $\times 15\frac{1}{2}$
- tomentosa*, female holotype, enlarged. *a*, Chela; *b*, third leg. (After Holmes).
- fab. (21500) — 6 — Third leg of female; *b*, third leg.

- cylindrica*, male (17952). *a*, Outer maxilliped, $\times 19$; *b*, a'.....
- franciscana*. *a*, Abdomen of male (48445), $\times 13\frac{1}{2}$; *b*, outer maxilliped of female holotype, $\times 13\frac{1}{2}$
- schnmitti*, male (25850). *a*, Outer maxilliped, $\times 15\frac{1}{2}$; *b*, abdomen, left or larger chela, $\times 7$
- niatus*, outer maxilliped of female holotype, $\times 19\frac{1}{2}$
- tubicola*. *a*, Outer maxilliped of female (20860), $\times 22\frac{1}{2}$; *b*, abdomen of male, Trinidad, $\times 15\frac{1}{2}$; *c*, left chela of male, $\times 6$, after Weymouth.....
- weymouthi*, male holotype. *a*, Outer maxilliped, $\times 20$; *b*, abdomen, $\times 7\frac{1}{2}$, after Weymouth; *c*, abdomen, $\times 16$
- affinis*, female holotype. *a*, Dorsal view, $\times 3$; *b*, endognath of outer maxilliped, $\times 22\frac{1}{2}$
- affinis*, right chela of female holotype, $\times 13$
- brevipollex*, female holotype, $\times 2\frac{1}{2}$
- brevipollex*, *a*, Outer maxilliped of female holotype, *b*, abdomen of male (21593), $\times 7\frac{1}{2}$
- x granulata*. *a*, Abdomen of male (49247), $\times 15\frac{1}{2}$; *b*, endognath of outer maxilliped of female paratype, $\times 15\frac{1}{2}$
- us transversus*, female (23927). *a*, Dorsal view, $\times 1\frac{1}{2}$; *b*, endognath of outer maxilliped, $\times 8$
- les chilensis*, male (22112). *a*, Endognath of outer maxilliped enlarged; *b*, abdomen, $\times 4\frac{1}{2}$
- les meinerti*. *a*, Outer maxilliped of female (5760), $\times 15\frac{1}{2}$; *b*, abdomen of male holotype, $\times 8$
- les tomentosus*, female, cotype. *a*, Outer maxilliped, $\times 15\frac{1}{2}$; *b*, abdominal outline, nat. size. (After Ortmann.).....
- abripes*, female holotype. *a*, Right chela, $\times 5$; *b*, outer maxilliped, $\times 5\frac{1}{2}$; *c*, dorsal aspect, $\times 2\frac{1}{10}$

- men of male (same as c), $\times 7\frac{1}{2}$; f, left oculo-antennal region, $\times 7\frac{1}{2}$; g, merus and carpus of first left leg of female holotype, $\times 5$; h, left cheliped of male, outer face, $\times 4$; i, right cheliped, outer face, $\times 4$.
- Cololia obesa*, immature female (not male) holotype, after A. Milne Edwards and Bouvier. a, Dorsal view, $\times 3$; b, endognath of left outer maxilliped, $\times 6\frac{1}{2}$; c, first left leg, upper side, $\times 5$; d, last segment of same, $\times 8$; e, left frontal and orbital border, from above, $\times 7\frac{1}{2}$; f, left oculo-antennal region, ventral view, $\times 7\frac{1}{2}$.
- Cololia tuberculata*, male, $\times 1\frac{1}{2}$, after Faxon. a, Dorsal view; b, left oculo-antennal region, ventral view; c, right oculo-antennal region, dorsal view; d, right outer maxilliped, $\times 8$; e, merus and carpus of first left leg, upper side, $\times 5$; f, left outer maxilliped, $\times 8$; g, sternum of male, $\times 5\frac{3}{4}$.
- Cololia depressa*, young female (6505, M. C. Z.), after A. Milne Edwards and Bouvier. a, Left oculo-antennal region, ventral view, $\times 8$; b, right oculo-antennal region, ventral view, $\times 8\frac{1}{2}$; c, merus and carpus of second left leg, outer side, $\times 11$; d, endognath of left outer maxilliped, $\times 18$; e, right outer maxilliped, enlarged.
- Cololia fragilis*, male, enlarged, after Faxon. a, Dorsal view; b, left oculo-antennal region, ventral view; c, right oculo-antennal region, ventral view; d, right frontal and lateral border, $\times 5$; e, merus and carpus of third left leg, outer side, $\times 5$; f, merus and carpus of first left leg, upper side, $\times 5$; g, left cheliped, outer side, $\times 8$.
- Cololia cursor*, after A. Milne Edwards and Bouvier. a, Dorsal view of female shown in fig. 130, $\times 3\frac{1}{2}$; b, same view of female (6409), $\times 4$.

- holotype, $\times 3\frac{1}{2}$; *d*, top view of right chela of same, slightly enlarged; *e*, outer view of same, slightly enlarged.....
- Grapsus typicus*, male (19863), dorsal view, slightly reduced.....
- Grapsus typicus*, male, holotype. *a*, Outer maxilliped (showing median line), $\times 4$; *b*, abdomen, $\times 1\frac{1}{2}$; *c*, right orbital region, ventral view, $\times 2\frac{1}{2}$
- Grapsus typicus*, right or major cheliped. *a*, Anterior view in Halifax Museum, natural size; *b*, upper view of same size; *c*, anterior view of 19863, $\times 1\frac{1}{4}$
- Grapsus americanus*, outer maxilliped, enlarged. (After A. Milne and Bouvier.).....
- (*Sesarma*) *sulcatum*, abdomen of male (4631), $\times 1\frac{1}{2}$
- (*Sesarma*) *aequatoriale*, natural size. *a*, Right chela of male, dorsal view; *c*, abdomen of male. (After Ortmann.)
- (*Sesarma*) *curacaoense*, left appendage of first segment of abdomen (17678), lower view, $\times 4\frac{1}{2}$
- (*Holometopus*) *occidentale*, male holotype. *a*, Anterior view, $\times 1\frac{1}{3}$; *b*, carapace and eyes, dorsal view, $\times 1\frac{3}{5}$; *c*, third leg, chela, outer view, $\times 1\frac{1}{3}$; *e*, last five segments of abdomen, appendage of first segment of abdomen, $\times 7$
- (*Holometopus*) *cinerum*, male (15072). *a*, Abdomen, $\times 1\frac{1}{2}$; *b*, appendage of first segment of abdomen, ventral view, $\times 7\frac{1}{2}$
- (*Holometopus*) *biolleyi*, abdomen of male holotype, $\times 3\frac{1}{2}$
- (*Holometopus*) *tampicense*, left appendage of first segment of abdomen of male holotype, ventral view, $\times 8$
- (*Holometopus*) *hanseni*, male holotype. *a*, Abdomen, $\times 1\frac{1}{2}$; *b*, appendage of first segment of abdomen, ventral view, $\times 5\frac{1}{2}$
- Grapsus punctatus*, outer maxilliped, enlarged. (After Milne and Bouvier.)
- Third right leg of male of, *a*, *Plagusia depressa* (40609), $\times 10$

e, larger chela, inner face.....
yeri, male (23753), natural size. *a*, Dorsal view; *b*, inner
ger chela.....
llerri, male, X 3. *a*, Dorsal view of holotype; *b*, inner s
chela (25666).....
usica, male holotype, X 3½. *a*, Lower view of larger, le
ing stridulating ridge; *b*, anterior (lower) view of portion
leg, showing granules which play against stridulating ridge
oric bowl unearthed in Costa Rica, the base representing
crab, *Cardisoma guanhumi*, with the claws folded under t
out ¾. Original in possession of Mrs. Zeledon, cast in U. S.
um.....

PLATES.

tinus dentatus.

ex typhla.

plax elata.

c barbata and *sigsbei*.

c barbata.

lax atlantica and *Tetraplax quadridentata*.

x nitida.

tinus carolinensis.

tinus granulimanus.

tinus ostrearicola and *californiensis.*

x spinidentata.

x depressa and *Eucratopsis crassimanus.*

granulata and *Glyptoplax smithii.*

arcinus obliquus and *Pseudorhombila octodentata.*

teres holmesi and *ostreum.*

teres geddesi and *angelicus.*

teres deppressus, *maculatus*, and *pugettensis.*

lia laevigata and *Cymopolia sica*.

inens and *Cymopolia floridana*.

alternata.

alternata.

lucasii and *zonata*.

zonata and *faxonii*.

affinis.

bahamensis and *affinis*.

rathbuni and *isthmia*.

obesa.

gracilis.

gracilis and *fragilis*.

cursor and *gracilipes*.

apsus.

apsus.

lividus.

us variegatus.

truentata.

pulchra.

us crassipes.

us maurus and *gracilis*.

us gracilis and *transversus*.

us marmoratus.

nutus.

rinus.

us angulatus.

us altimanus.

us affinis.

us crenulatus.

us nudus.

(*Holometopus*) *benedicti*.

rma rubripes.

m curvatum.

nisonii.

psus integer and *Metopaulias depressus*.

psus cinereus.

psus punctatus.

nathus granulata.

depressa.

depressa tuberculata.

immaculata.

chabrus.

gibbesi.

na guanhumi, male, dorsal view.

na guanhumi, female, ventral view.

na crassum, male, dorsal view.

na crassum, male, ventral view.

ordatus, male, dorsal view.

ordatus, male, ventral view.

ordatus, female, dorsal view.

ordatus, female, ventral view.

ccidentalis, male, dorsal view.

ccidentalis, male, ventral view.

ccidentalis, male, antero-dorsal view.

us ruricola, female, dorsal view.

us ruricola, female, ventral view.

us lateralis, male, dorsal view.

us lateralis, male, ventral view.

us quadratus, male, dorsal view.

us quadratus, male, ventral views.

na planatus, male, dorsal view.

ulata.
radensis.
nicarpa.
amensis.
guayensis.
eri.
tedi and *stenodactylus.*
odactylus.
rica.
cylindrica.
odactyla.
manus.
lax pugnax and *smithii.*
opsis crassimanus, *Ucides cordatus*, *Pinnotheres politus* and
arcinus carolinensis, *Cyrtograpsus angulatus*, and *Chasmagnathus*
pubescens and *corrugatus*, *Uca pugilator*, *subcylindrica*,
(Sesarma) curacaoense, and *Gecarcoides lalandii.*
ropleura and *insignis.*

By MARY J. RATHBUN,

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INTRODUCTION.

This volume is part of a work projected many years ago as a handbook for the study of American crabs, the main purpose being to give a brief description with figures of each species. In the meantime the character of the work has been somewhat changed so as to include a detailed catalogue of the specimens in the United States National Museum. Unavoidable delay in preparation has led to accumulation of material which has greatly augmented the number of known species. As a result the work has been expanded into four volumes, of which the present one, dealing with the Grapsoids and Comatopes, is the first.

SOURCES OF MATERIAL.

The collections in the United States National Museum form the basis of this bulletin. They consist chiefly of material obtained by the United States Government bureaus, such as the Bureau of Fisheries (known previous to July 1, 1903, as the United States Fish Commission). Through the activities of its various vessels and laboratories the Bureau of Fisheries has been able to transfer to the National Museum vast accumulations from nearly all the coasts of America. The amount of work accomplished by the steamers *Albatross*, *Seal Hawk* and the schooner *Grampus*, as well as by other vessels of the commission in earlier years, is indicated in the detailed lists of specimens.

Other Government explorations that have yielded considerable results are those constantly carried on by the Bureau of Biological Survey of the Department of Agriculture and those occasional

ological Station, Venice, California; and various universities, the Stanford University and the University of California. Through a system of exchanges reciprocal benefit has been derived from many of the larger museums, such as the Museum of Comparative Zoology, Cambridge, Massachusetts; the Peabody Museum of Yale University, New Haven, Connecticut; the Museu Paulista, São Paulo, Brazil; the Museo Nacional, at Valparaiso, Chile; and in Europe, the Muséum d'Histoire Naturelle, Paris, France; the Zoological Museum, Copenhagen, Denmark; and others.

SPECIAL RESEARCHES.

In the eighties, the early days of the United States National Museum, the collection of crustaceans, as well as of other invertebrates, was in charge of Dr. Richard Rathbun, at that time an assistant on the United States Fish Commission. The collection was of moderate a size that it was possible for a single curator to classify the larger and more conspicuous forms in various groups. At that time Prof. Sidney I. Smith, of the United States Fish Commission, had charge of the Decapods of the northeast Atlantic off America which were obtained by the commission, and the material forming the basis of his reports was subsequently transferred to the museum. Later Dr. James E. Benedict was made an assistant curator of marine invertebrates, and the then rapidly increasing number of decapod crustaceans occupied a large share of his attention. When the present writer took up the subject the commoner and more abundant forms were already worked over. The nomenclature, however, proved to be in a very unsettled condition, on account of ignorance of the true status of type-specimens in some of the European museums, the misinterpretation of the descriptions of the types by others, and the consequent repetition of errors in literature. In 1896 therefore the writer visited six European museums to examine certain types, those of J. C. Fabricius in the museum of Copenhagen and Kiel, of Herbst in Berlin, of Saussure in Geneva,

ACKNOWLEDGMENTS.

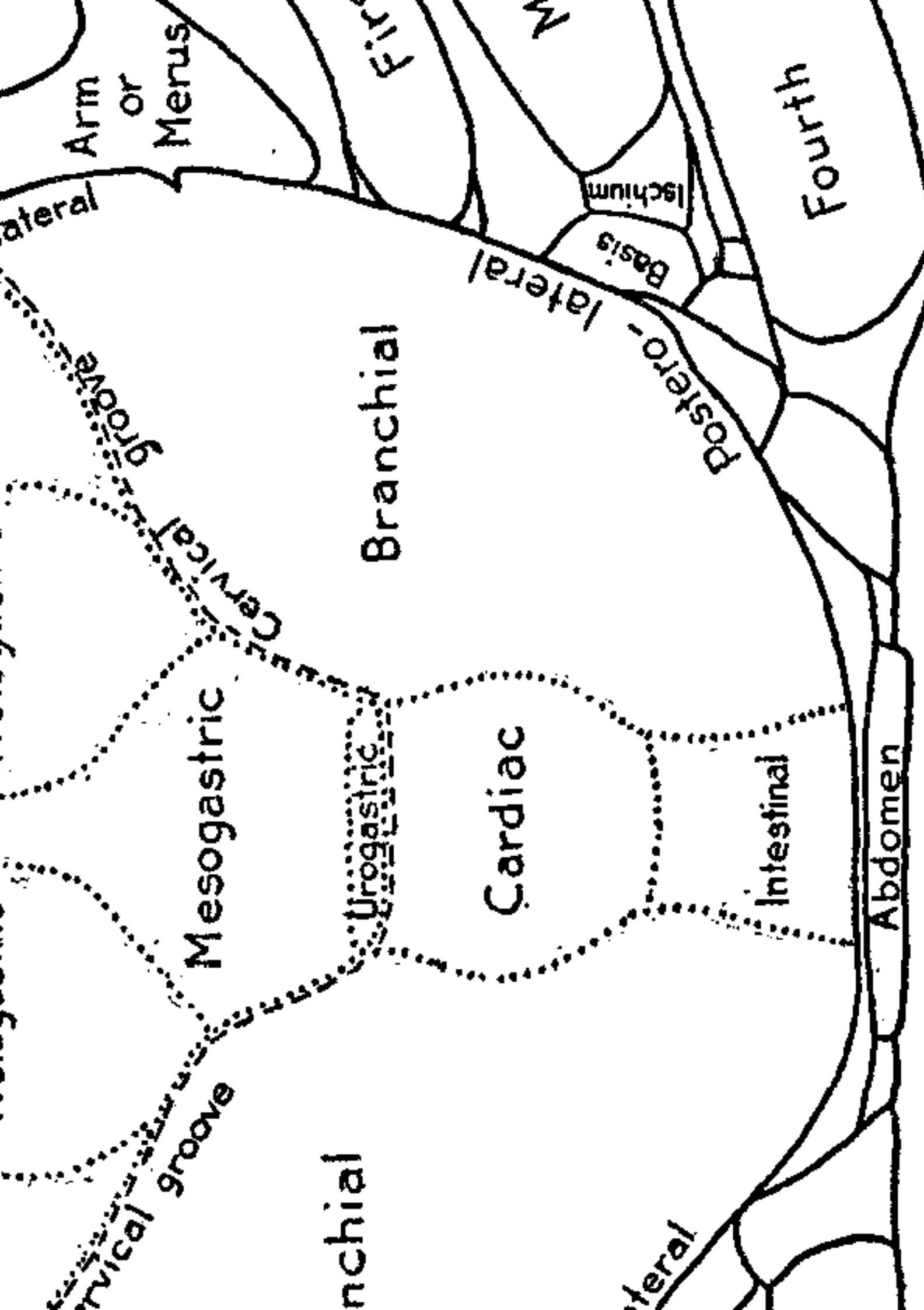
My thanks are due to all those who assisted me during this European trip—to Prof. E. L. Bouvier, Dr. F. Meinert, Dr. H. J. Hahn, Dr. K. Brandt, Prof. F. Jeffrey Bell, and Dr. R. I. Pocock; and also to those who in the meantime have passed away—Prof. Milne Edwards, Dr. C. Lütken, Dr. F. Hilgendorf, and Prof. H. Saussure.

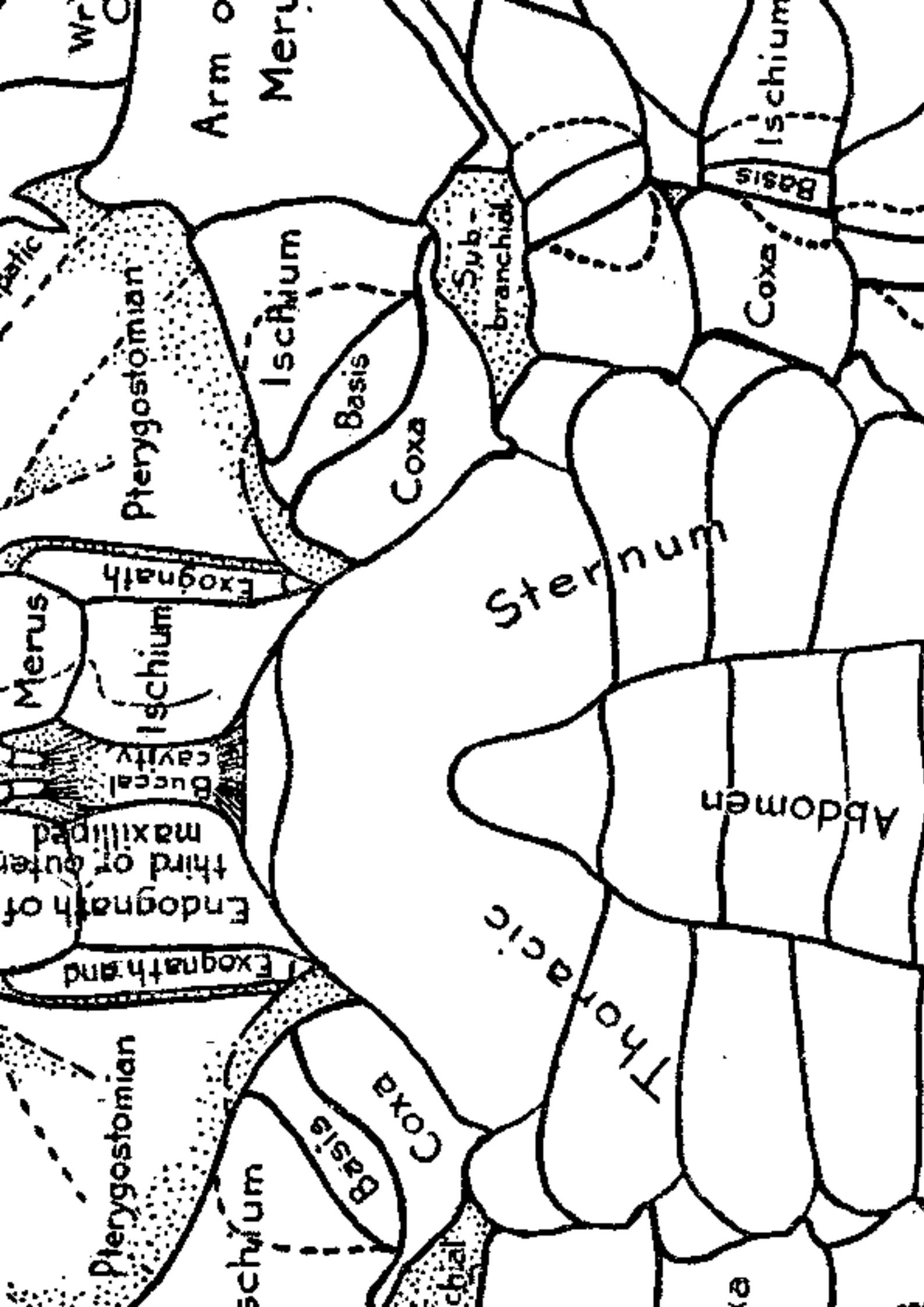
Were I to name all of the correspondents who have contributed advice, loans, gifts, notes, or otherwise toward the completion of these volumes on American crabs, the list would include nearly all carcinologists, museum curators, professors of zoology, and students.

At the moment, however, I am especially indebted to those who have obtained for my use additional material in the Pinnotheridae group difficult to understand without well-preserved and abundant material. They are Dr. C. McLean Fraser, who recently collected several hundred specimens in the neighborhood of Vancouver Island; Dr. F. W. Weymouth, who forwarded the collection belonging to Stanford University; Dr. Walter Faxon, who loaned the collection of the Museum of Comparative Zoology; and Dr. W. T. Calman, of the British Museum, who arranged the loan of a valuable type-specimen. Permission has been freely granted by Dr. H. M. Smith, Commissioner of Fisheries, and by Dr. C. H. Townsend, of the New York Biological Society, to use data which form part of special reports yet unpublished.

The classification of the higher groups adopted in this report is that of Borradaile, and the keys to the same have been borrowed from his summary published in 1907. Likewise the definitions of families and subfamilies are copied or adapted from those given by Borradaile in his work on the Catometopa of India.¹

In the immediate preparation of this report I am indebted to my colleagues in the United States National Museum, and above all to Waldo L. Schmitt, assistant curator of marine invertebrates.





is much wider in the female than in the male.

current channels, the openings through which water passes to the branchial gills and in front of the chelipeds, save in certain of the Oxystomata where they open at the antero-lateral angles of the palate or endostome.

bulatory, or walking legs, usually four pairs, are behind the chelipeds. They may be only 3 in number, as in the genus *Cymopolia* where the last pair of thoracic legs are delicate and tendril-like, as if used for attachment to foreign objects.

ennae, or second pair of antennae, that pair of antennae situated between the antennules and the orbits.

cnnules, or antennae of the first pair, those antennae lying near together on either side of the median line.

merus, the merus of a cheliped.

pis, or basipodite, the second segment (from the body) of a leg or maxilliped.

branchial region (paired), the very large lateral area of the carapace, behind the cervical suture.

cal cavity, or buccal cavern, the cavity on the ventral surface of the body in which are situated the mouth-parts; it is bounded anteriorly by the epistome, laterally by the free edges of the carapace.

carapace, or cephalothorax, the shell which covers the dorsal surface, and the lateral portions of the ventral surface, of the body.

cardiac region, the median area of the carapace, behind the cervical suture.

pus, or carpopodite, the fifth segment (from the body) of a leg or maxilliped.

cervical groove, the complex groove, or series of grooves, running across the carapace, the groove being transverse at the middle, then turning on each side obliquely forward and outward to the lateral margin. It separates the hepatic and gastric regions from the branchial and cardiac regions.

claw, or claw, the two last segments of a cheliped.

cheliped, the pair of thoracic legs immediately behind the maxillipeds or jointed feet. They bear the chelae or pincer-claws and are usually stouter, sometimes much stouter than the succeeding or walking legs.

coxa, or coxopodite, the first or proximal segment of a leg or a maxilliped.

dactylus, or dactylopodite, the seventh or terminal segment of a leg or maxilliped. The dactylus is the movable finger of a cheliped.

distal, farthest from the center of the body; opposed to proximal.

current channels, the channels through which water passes from the branchial gills; they open at the sides of the endostome, except in the subtribe Oxystomatinae where they open at the middle of the endostome.

region, the large median area, bounded behind by the cervical spine, outside by hepatic regions, and anteriorly by the fronto-orbital region. It is divisible into the following subregions or lobes: Mesogastric, perigastric, epigastric, metagastric, and urogastric.

branchial region (paired), a small subtriangular, antero-lateral region, well defined between the branchial and gastric regions and either the margin of the carapace or the margin of the orbit.

crantennular septum, the plate which separates the two antennular cavities from each other.

cardinal region, a short transverse area behind the cardiac region. Sometimes called the posterior cardiac lobe.

ischium, or ischiopodite, the third segment (from the body) of a leg or maxilliped. It is usually the first large segment of the maxilliped.

maxillipedal region. See *Pterygostomian region*.

buccal border, the anterior border of the buccal, or mouth cavity.

manus, or palm, the broad, proximal part of the propodus of a cheliped.

maxillipeds, the three outermost pairs of jaw-feet, the third or outer pair forming more or less of an operculum to the buccal or mouth cavity.

merus, or meropodite, the fourth segment (from the body) of a leg or maxilliped. It is usually the first long segment of a cheliped, or walking leg.

metagastric lobe or subregion, the median division of the gastric region, pentagonal in form and with a long, narrow, anterior prolongation.

postogastric lobes, the postero-lateral lobes of the gastric region; often ill-defined.

orbital hiatus, the gap in the orbital margin at its lower, inner angle.

orbital region, the narrow space bordering the upper margin of the orbit; not always distinguishable.

palpus, or palpus, of maxilliped, consists of the last two or three segments following the merus-joint.

chelipods, a term applied to the chelipeds and four pairs of legs.

pollex, the immovable finger of the cheliped. The term "pollex" has been used, however, by some writers, for the movable finger, a use not without justification.

propodus, or propodite, the sixth or penultimate segment of a leg or maxilliped. In a cheliped, the propodus consists of the palmar portion or manus, a narrower, immovable finger.

pterygostomian lobes or subregions, the antero-lateral lobes of the gastric region.

proximal, nearest the center of the body; opposed to distal.

ptyerygostomian region, the triangular space on the ventral surface of the carapace, on either side of the buccal cavity. Sometimes called the juxtagastric region.

amo, the immovable finger of the cheliped.
ogastric lobe, the postero-median lobe of the gastric region. Sometimes
the genital region.

ist, the carpus of a cheliped.

Explanation of measurements.

The length of the carapace, unless otherwise stated, is measured along 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 is measured from the tip to the posterior edge 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 along the upper or anterior margin. The length of the whole cheliped is measured on the lower margin, from the articulation of the chela with the sternum to the tip of the dactylus.

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.

black	gy	gray	S	sand
brown	hrd	hard	scattered	scattered
broken	lge	large	sft	soft
blue	lt	light	Sh	shells
coral	M	mud	sm	small
coarse	Oz	ooze	Sp	specks
dark	P	pebbles	St	stones
fine	Ftr	Pteropod	stky	sticky
foraminifera	R	rock	vol	volcanic
gravel	rd	red	w	seaweed

useum of the State University of Iowa; y. = young. The w
J. S. Fisheries" should be understood before "Str. *Albatro*
Str. *Fish Hawk*," or "Sch. *Grampus*."

In the same lists there have been entered, besides specimens in
tional Museum, many types examined elsewhere, as well as s
ecimens from other collections as increase our knowledge of
nge of the species, but for lack of space no attempt has been m
record all of the many specimens examined in museum
ivate collections.

THE GRAPSOID OR CATOMETOPOUS CRABS OF AMERICA.

The term Catometopa or "square-fronted" was early¹ applied
group of crabs which was contrasted with the Cyclometopa
ound-fronted" crabs. These terms were abandoned² because
e group was found to merge gradually into the other. The n
achyrhyncha was given to the whole. Aside from intergrad
ums, the so-called Catometopa contain many types that are
quare-fronted." In 1851³ Dana first used the word Grapsoi
this group, *Grapsus* being the typical genus. The name Grap
herefore used in the title of the present paper as a short and c
nient term to indicate the content of the volume.

The key on pages 13–15 gives the relation of the families li
allt with to the remainder of the Brachyura, or short-tailed cr
.. The family Gonoplacidae links the Catometopes to the Cyclo
es and is most closely allied to the family Xanthidae, some of
hera having the form of the Panopeids or mud crabs, and differ
m them chiefly in the characters of abdomen and sternum and
pe of the chelae. The Gonoplacids, being bottom-dwelling for
taken almost exclusively in the dredge or tangle.

. The Pinnotheridae is a large family of small crabs, chiefly c
nsal, sometimes free-swimming and occasionally parasitic. W
most crabs the male is stronger than the female, especially
ards the chelipeds, and often attains a greater maximum size,
erse is true in many Pinnotherids. The female may not only

as up to this time not a single male of that species has recorded, and only one immature specimen has been seen by present writer or is known to exist in any collection.²

In order to emphasize our lack of knowledge of this important and interesting little family I have, in dealing with the genus *Pinnotheres*, made a list of the American species with an indication of the known sex or sexes of each. It is hoped that this will lead greater interest among workers at the laboratories along our coast seeking and preserving examples of Pinnotheridae. They are sought for not in the usual haunts of crabs, but in the shells of valve mollusks, such as oysters, clams, mussels, and scallops; in tubes of annelid and sipunculid worms, in ascidians, in the intestinal tract of certain globular sea-urchins, and on the outer surfaces of sand dollars and other flat urchins, with all of which animals they may be commensal. In some cases the males, however, may be free swimming and should be looked for in plankton or tow-net hauls.

3. The Cymopoliidae are unique in structure, related in no way to the Catometopes, but in the small filiform legs of the first pair resembling the Dorippidae, near which they are grouped by some authors. They come from water of considerable depth. Nothing is yet known of their habits or the function of their delicate filiform legs, whether used to support a protective covering of sponge or ascidian, as in the Dromiidae, or serving as tendrils to climb the branches of alcyonarians, hydroids, and algae.

4. The Grapsidae embrace large numbers of shore and shallow water crabs, as well as a few which inhabit fresh water or are semi-terrestrial, living at considerable distance from the sea.

5. The Gecarcinidae are land crabs, often of large size, with smooth, thick carapaces and more or less spinous legs.

6. The family Ocypodidae is represented in this hemisphere by the sand crabs or ghost crabs and the fiddler crabs (genus *Uca* formerly *Gelasimus*). In this group the length of the eyestalks is correspondingly narrowed by the frontal projection or rostrum carried to an extreme, as is also the difference between the claws of the two sexes. Both chelipeds in the female and one (either

l with the epistome at the sides and nearly all the last of the thoracic sternal somites fused with each other; the basis and ischium of the chelipeds always united; the abdomen brachyurous (small, bent under the thorax, showing no traces of segmentation), and without biramous limbs on the ventral side; by lacking a movable antennal scale; and by having the eyes broad.

Development.—Crabs, as a rule, pass through two or three stages of development after leaving the egg, to reach the form of the adult. The first stage is known as the zoea; the carapace is relatively stout and usually spineless, the thoracic legs are undeveloped, the body slender. The zoea may molt several times, with gradual changes, but eventually in shedding its skin it develops into a very different larval stage, the postembryonic larva. This stage is more in common with the adult than does the zoea. In the postembryonic larva the long spines of the carapace have disappeared, and the long setae are at the ends of movable stalks; the five thoracic legs are developed and similar to those of the adult; and the body is elongated and tapering, being used for locomotion; the telson or abdominal rami are bent forward under the ventral surface of the body. There are exceptions to the above rule of postembryonic larval forms. Such are the river-crabs of the family Potamidae.

from the egg in a species of the Oxyrhyncha
OGOUS SPECIES ON OPPOSITE SIDES OF THE CONTINENT.
out this volume, after the keys to species, I
parallel columns those closely related species occur-
des of the continent. The resemblance between
these pairs is much greater than between others
assembled in a single list, followed by a list of those
occur on both sides of the continent; those of world-
wide distribution indicated by an asterisk (*).

Family GONEPLACIDAE.

le.	Pacific.
<i>atlantica.</i>	<i>Prionopla^x ciliata.</i>
<i>ida.</i>	<i>Euryplax polita.</i>
<i>carolinensis.</i>	<i>Specocarcinus granulimanus.</i>
<i>mithii.</i>	<i>Glyptopla^x pugnax.</i>
<i>nus typicus.</i>	<i>Chasmocarcinus latipes.</i>

Family PINNOTHERIDAE.

<i>ostreum.</i>	<i>Pinnotheres holmesi.</i>
<i>niae.</i>	<i>Fabia canfieldi.</i>
<i>hendersoni.</i>	<i>Parapinnixa nitida.</i>
<i>bouvieri.</i>	<i>Parapinnixa affinis.</i>
<i>ipolle^x.</i>	<i>Pinnixa affinis.</i>

<i>verti.</i>	<i>Sesarma angustum.</i>
<i>s integer.</i>	<i>Cyclograpsus cinereus.</i>
<i>guanhumi.</i>	
<i>atus.</i>	
<i>ruricola.</i>	
<i>tateralis.</i>	
	<i>Cardisoma crassum.</i>
	<i>Ucides occidentalis.</i>
	{ <i>Gecarcinus quadratus.</i>
	{ Atlantic side of the Ist

Family OCYPODIDAE.

<i>cicans.</i>	<i>Ocypode occidentalis.</i>
<i>ani.</i>	<i>Uca monilifera.</i>
<i>hclos.</i>	<i>Uca princeps.</i>
<i>a.</i>	<i>Uca crenulata.</i>
<i>ndrica.</i>	<i>Uca stenodactylus.</i>

SPECIES ON BOTH SIDES OF THE CONTINENT.

Family GRAPSIDAE.

<i>grapsus.*</i>	
<i>us lividus.</i>	
<i>pus transversus.*</i>	
<i>inutus.*</i>	
<i>pus angulatus.</i>	
<i>(Holometopus) angustipes.</i>	
<i>sonii.</i>	

Family GECARCINIDAE.

s triangular. Orbita generally incomplete.

Superfamily

part of body broad. Rostrum usually reduced or wanting, round, or square. Orbita nearly always well inclosed.

Superfamily BRACHYRHYNCHI

KEY TO THE FAMILIES OF THE SUPERFAMILY BRACHYRHYNCHI

formed, but more or less incomplete. Second antennal flagella short, long and hairy. Rostrum present. Body elongated, mouth indistinct. Family *Euryalidae*. Orbita complete (though fissures may remain), except in the males where the eyes are almost or quite unprotected. Body rather broad. Rostrum often wanting. Second antennal flagella wanting.

Basipodite of third maxillipeds articulates at or near antero-inferior margin of the merus. Body usually round or transversely oval. Chelipeds nearly always coxal. In many species the right chela is larger than the left.

Basipodite of first maxillipeds more or less distinctly adapted for swimming. Usually the inner angle of the endopodite in the first maxillipeds is acute, the first antennae fold slanting or transverse. Family *Portunidae*. Basipodite of first maxillipeds not adapted for swimming, or if so modified, then the first antennae fold acute, the first antennae fold opening sternally or runs in a sternal groove. Inner angle of the endopodite in the first maxillipeds wanting.

Fresh-water crabs with the branchial region much depressed, swollen. Body often squarish, but male openings coxa-

Family *Brachyura*

Marine crabs with the branchial region not greatly swollen. First antennae fold lengthwise.

Carapace subcircular. Second antennal flagella either

third maxillipeds not hidden.

Front narrow. Female openings in normal position. "peds subpediform, not covering the mouth.

Family *Retroplumidae*=*Palaemonidae*

Front moderately broad. Female openings on the sternum corresponding to the first pair of walking legs. Third maxillipeds large, cover the mouth to a large extent and have very strong denticles..... Family *CYMOPOLIIDAE*=*Palaemonidae*

Front narrow. Last pair of legs not dorsally placed nor markedly weaker than the rest. Interantennular septum not very thin.

A gap of greater or less size is left between the third and fourth maxillipeds.

Front very or moderately broad.

1. Sides of the body either straight or very slightly arched. Body squarish. Front broad. Rarely true land crabs.

Family *GRAPSIDAE*

2. Sides of the body strongly arched. Shape transversely compressed. Front narrower. Land-crabs..... Family *GECARCINIDAE*

The third maxillipeds almost or quite close the mouth. Body moderately or very narrow..... Family *OCYPODIDAE*

of third maxillipeds small, bearing terminally a carpus wider than its own width. Ischium very broad. Body somewhat compressed. Antennae not retractile into sockets. Parasitic on corals.

Family *Haploporidae*

Family *GONEPLACIDAE* (Dana).

cidae DANA, Amer. Journ. Sci., ser. 2, vol. 12, 1851, p. 12; Proc. U. S. Natl. Exped., vol. 13, Crust., pt. 1, 1852, pp. 308 and 310; Journ. Asiatic Soc. Bengal, vol. 69, 1900, pp. 283, 286, 287. Type, *Goneplax* (now a synonym).

se of the third segment of the male abdomen does not exceed the space between the last pair of legs.

Fronto-orbital width more than half the width of the carapace at third segment _____
in same line _____ Subfamily *Prionopeltidae*
Fronto-orbital width almost as great as the total width of the carapace. Eyestalks long. Carapace of ocypodine form, postero-lateral margins converging.

Antennae excluded from the orbit _____ *Embletoniidae*
Antennae entering the orbit _____

Carapace wide. Merus of outer maxilliped broader than the inner _____
1. Carapace quadrilateral _____ *Prionopeltidae*
2. Carapace hexagonal _____ *Chasmodesidae*

Carapace narrow. Merus of outer maxilliped as long as the inner _____ *Tetraclitidae*

Fronto-orbital width from one-half to three-fourths the total width of the carapace. Eyestalks short. Antero-lateral margin of the carapace distinctly converging posteriorly. Eyestalks diminishing to the tip.

Postero-lateral margins converging posteriorly _____ *Cymothoidae*
Postero-lateral margins subparallel _____ *Speoceridae*
Eyestalks enlarged at the corneal end. Postero-lateral margins distinctly converging posteriorly.

Fronto-orbital border about half total width of carapace _____
1. Upper surface of carpus of cheliped subrectangular _____ *Pseudoscorpionidae*

1. Upper surface of carpus not subrectangular _____ *Oecanthidae*
Fronto-orbital border from three-fifths to three-fourths the total width of the carapace.

1. Carapace broad, width $1\frac{1}{2}$ times length _____ *Parathelphusidae*
1. Carapace narrow, width about $1\frac{1}{3}$ times length.

well defined; buccal cavern square-cut and used by the external maxillipeds, which have a surface base of the third segment of the male abdomen pace between the last pair of legs. Male op-

ed in America by three genera.

Genus **TRIZOCARCINUS** Rathbun.

inus RATHBUN, Proc. U. S. Nat. Mus., vol. 47, 1914, p. 10.
ntatus (Rathbun).

deep, subquadrilateral, somewhat broader than long, divided into four transverse regions, convex in both directions. Width of the carapace wider about three-fourths of the greatest breadth. Antero-lateral borders arched, dentate.

are-cut, straight, faintly notched in the middle, from the supra-orbital angles, between one-third and one-half the width of the carapace. Upper margin of orbital lobes. Basal antennal joint short, the flagellum extending beyond the orbital hiatus. The antennules fold transversely, the cavity widening distally, not completely closed at the apex, the merus of which has a concave anterior margin, the external lobe projects forward not outward. Buccal channels well defined. A stridulating ridge of setae runs obliquely backward from the anterior margin of the buccal cavity; and is played upon by a short ridge of chelipeds.

ption.—Carapace about four-fifths as long as median portion almost level and bordered by a from which the anterior and tions slope downward. C mesogastric regions in part Surface short-hairy, unequal.



HIZOCARCINUS DENTATUS
LATERAL VIEW OF LEFT
CARAPACE OF MALE
♂, SHOWING STRIDU-
RIDGE, X 4.

Front bimarginate, deep inner angle of orbit a sub Three flattened, upturned, subequal antero-lateral teeth. teeth and orbit denticulate lateral margins subparallel. mian ridge crossed by ab striae. A short complementa lists on the lower proximal m

face of the arm, and is crossed obliquely by 10 s granulate, outer face of carpus and chela except tips of fingers. An upper marginal spine third; a lower subterminal spine. Inner spine toward. Chelae flattened, margins serrulate; fin hed, not gaping. Inner surface of propodus w surface below.

long and narrow; last three joints long, hair segment of male abdomen the widest, first and

B. typhna A. Milne Edwards.

hexagonal; antero-lateral margins arcuate and lateral margins converging.

light, about two-fifths width of carapace. Orbita defined; eyes small, immovable, deficient in standing in the orbital hiatus; broad joint reaching prolongation of the front; flagellum long. Ab-

domen widening rapidly anteriorly. Palatal ridge wider than the ischium, its middle expanded.

dissimilar. Ambulatory legs slender. Chelipeds widest at third segment which reaches the coxae of the ambulatory legs; no segments fused.

species known.

BATHYPLAX TYPHLA A. Milne Edwards.

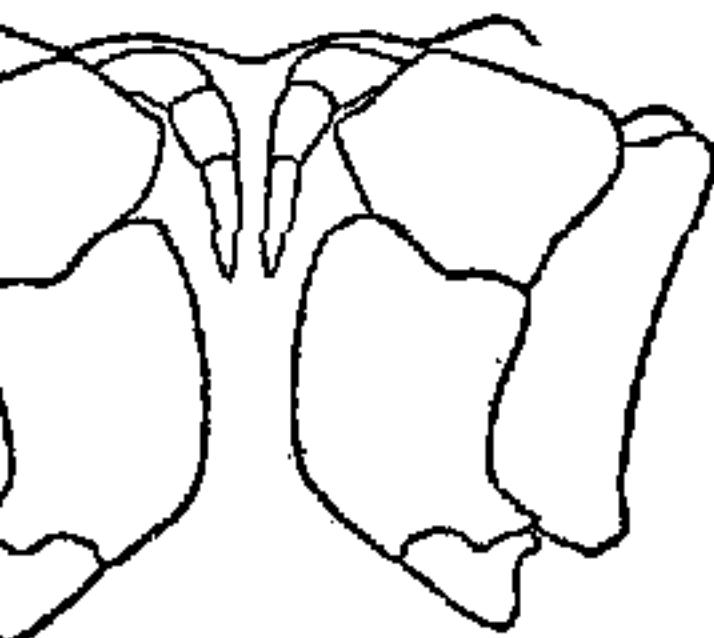
Plate 2.

B. typhlus A. MILNE EDWARDS, Bull. Mus. Comp. Zoöl., 1837, p. 230, pl. 20, fig. 3 (type-locality, Frederickstadt, St. Croix Island, 451 fms.; C. Z.).

p. 230, pl. 20, fig. 3 (type-locality, south of Pernambuco, 451 fms.; type in Brit. Mus.).

B. typhlus, var. *oculiferus* Miers. Challenger Rept., Zool.—Orbits rudimentary; eyes immovable, almost very wide in front. Chelipeds dissimilar; strig-

Left chela shorter, very thin, and expanded
at the propodus, immovable finger in consequence
in the right chela, fingers not gaping; upper
duced inward in a blunt tooth.



a



b

THYSPLAX TYPHLA, MALE (9729). *a*, OUTER MAXILLIPIEDS, S₁ AND S₂, X 4; *b*, ABDOMEN AND PART OF STERNUM, X 3; *c*, LEFT CH

long and very slender, margins granulous, surface granulations with a thin fringe of long hair.

Measurements.—Male (9724), length of carapace 16.5 mm.

—From Gulf of Mexico to Pernambuco, Brazil.

Material examined.—

Gulf of Mexico: off the west of Cape San Blas, Florida: Lat. 28° 36' 10" N.; Long. 87° 10' W.; 347 fathoms; gy. M.; temp. 44.1° F.; M. 205. All bottom: 1 male (9724). Lat. 28° 24' 0"

s often faintly indicated. Fronto-orbital border, the greatest breadth of the carapace; the borders are slightly arched or oblique.

slight, rather prominent, more or less confluent at angles, often notched or grooved in the middle border often with two fissures. The antennae of good length, stands in the orbital hiatus. Transversely or nearly so.

width widening a little anteriorly, almost close

more massive than the legs, which are slender.

in the female and commonly in the male several times the width of the head. The third segment covers the whole width of the head. Found in the North Pacific, Indian and South Atlantic (deep sea), Arabian Sea, Malayan Islands, Fiji.

X TO THE AMERICAN SPECIES OF THE GENUS PILUMNOPLAX.

flat, regions scarcely indicated. No segments of male abdomen fused.

-----*americanus* Rathbun. Carapace convex in an antero-posterior direction, regions definitely defined. First and fifth segments of male abdomen fused.

PILUMNOPLAX AMERICANA Rathbun.

Pilumnoplax americanus RATHBUN, Bull. Lab. Nat. Hist. State of California, Vol. 1, p. 283, pl. 7, figs. 1 and 2 (type-locality, off Guadalupe Islands; male holotype Cat. No. 19652 U.S.N.M.).



FIG. 5.—*PILUMNOPLAX AMERICANA*, MALE, STATION 62, DORSAL VI-

p-lateral border much shorter than the posterodorsal one; upper lip and cut into four teeth, the first of which is obtuse, the second the obtuse orbital tooth, the next two acute and sharp.

Anterior margin of orbit fissured above near the middle, and slightly above and below near the outer angle; inner corner of orbit moderately prominent.

Chelipeds very unequal in both sexes, surface finely granulate; carpal wrist strongly prominent, with two acute teeth; fingers narrow, unarmed, granulate above, very sparsely so, the outer or longest.

*M*easurements.—Male (46184), length of carapace 12, width of same 7 mm. Female, length of carapace 13, width of same 8 mm. (Alcock).



FIG. 6.—*PILUMNOPLAX AMERICANA*, MALE, STATION 62, ANTERIOR PORTION OF CARAPACE, VIEWED FROM BEFORE, X 3.

: 127 fathoms; rky.; temp. 58° F.; Mar. 4, 1900.
Hawk; 2 males (46184).

PILUMNOPLAX ELATA (A. Milne Edwards).

Plate 3.

ax elata A. MILNE EDWARDS, Bull. Mus. Comp. Zoöl.,
(type-locality, West Florida, 13 fathoms; holotype
Mus.).

ax elata ? RATHBUN, Bull. Lab. Nat. Hist. State Univ. I.,
p. 281.

—Carapace convex, regions defined; edge of front lobe with one spine or tooth. Third, fourth, and fifth segments of male abdomen fused.

Description of male.—Carapace subquadrate, convex, with deep carinae in the branchial, hepatic, and intestinal region. Front deflexed, about two-fifths the width of the carapace, thin, divided into two very slightly convex, equal lobes, each as wide as half the front, with two short, closely spaced teeth, the first large outer notch; edge granulate; outer angle of each lobe nearly transverse. Antero-lateral margin with three teeth, the first and second small, triangular; the third the largest, broadest, and most prominent, acuminate; the fourth postero-lateral margin with two unequal, granulate; merus trigonal, thick, upper surface granulate.

unequal, granulate; merus trigonal, thick, upper surface granulate.

ooth. The tooth corresponding to the first obsolete; the next two are large and less outstanding; last tooth larger in female than in male. Larger in female than in male.

A variation.—In the young, the first and last teeth of the carapace are obsolete. The merus often has a pectinate or dentate elevation instead of a spine, as in the young.

Measurements.—Male (11407), length of carapace 7.5, width of front 4.1 mm. Female (19880), length of carapace 10.2, width of same 10.2, width of front 3.7 mm.

—East and west Florida; 13 to 193 fathoms.

Material examined.—

West of Cape San Blas, Florida; *Albatross*: Lat. 28° 07' 00" W.; 169 fathoms; gy. M.; Mar. 14, 1885; female (19879). Lat. 28° 38' 30" N.; long. 85° 30' W.; gy. M. brk. Sh.; Mar. 14, 1885; station 2402; 1 y. (19881).

Lat. 28° 36' 00" N.; long. 85° 33' 30" W.; gy. S.; Mar. 14, 1885; station 2402; 1 y. (19881).

Sand Key, Florida; Sand Key Light bearing NW by E. 1/2 N. $\frac{1}{2}$ E.; 50-60 fathoms; June 19, 1893; station 2402; 1 y. (Mus. S. U. I.).

Off Cape Florida; lat. 25° 40' 00" N.; long. 80° 00' W.; gy. S.; temp. 43.4° F.; Apr. 9, 1886; station 2402; 1 y. (11407).

subquadrilateral, with the antero-lateral angles bordered posteriorly convergent, a good deal broadly convex, regions faintly indicated.

and orbits occupy the whole anterior border square cut, laminar, obliquely deflexed, each to a third of the anterior border of the carapace occupied by the trenchlike orbits.

typically long and slender, but sometimes strongly

cornea; the antennules fold transversely; the basal joint and a slender flagellum of good length; orbital hiatus.

arity square or anteriorly widened, well separated at epistome; efferent branchial channels not well defined; the outer maxillipeds is square and bears the internal angle.

in both sexes much more massive than the legs, slender.

men in both sexes consists of 7 separate segments, third segment either covers or nearly covers the last pair of legs.

ed along the east coast of America from Gulf of Rio de Janeiro; in the northeast Atlantic and Mediterranean; Pacific from the Persian Gulf to Japan.

palm.
Description.—Carapace somewhat uneven, smooth, and
branchial region opposite the lateral spine. Orbita
lateral; next spine very small. Margin of
point at the middle. A notch in the upper margin
its inner angle.

The posterior border of the merus of the chelipod
middle there is a curved spine, which when the
tly under the small lateral spine. A prominent
inner angle of the carpus. Fingers nearly equal;
very fine, thick, light yellow hair on the distal
and the proximal part of the palm.

First segment of the male abdomen is very slender,
second very wide reaching the coxal joints and
third segment at its base equal in width to second.

Measurements.—Male, Grenada, length of carapace, 13.5;
width, 10.7; posterior width, 5.8; lateral margin of
abdomen, 1.5.

—Gulf of Mexico to Grenada, West Indies.
Material examined.—

of Mexico: S. of Apalachicola, Florida; lat. 28° 45' 02'' N.; long. 82° 00' W.; 30 fathoms; gy. S. brk. Co.; M. 1879, *Albatross*; 1 male (46309).

Cuba; 1893; State Univ. Iowa Exped.; U. I.).

Grenada; lat. 12° 01' 45'' N.; long. 61° 47' 25'' W.
Mar. 1, 1879; station 969. *Blakely*; 1 male (C.

margin, and a more oblique and shorter groove; pallex much broader than dactylus. Fingers without teeth.

of first three pairs of legs slender and longer than last pair of legs with the last three joints broadened, and broader than in *barbata*.

Material.—Adult female, station 254, length of carapace 19.8, basal width 13, posterior width 6.3, length of lateral margins

examined.—Off Grenada; lat. $11^{\circ} 27' 00''$ N.; long. $61^{\circ} 16' 00''$ W.; depth 164 fathoms; S. Sh.; temp. 57° F.; Feb. 27, 1903; Brit. Mus. (Cat. No. 4117, M. C. Z.).

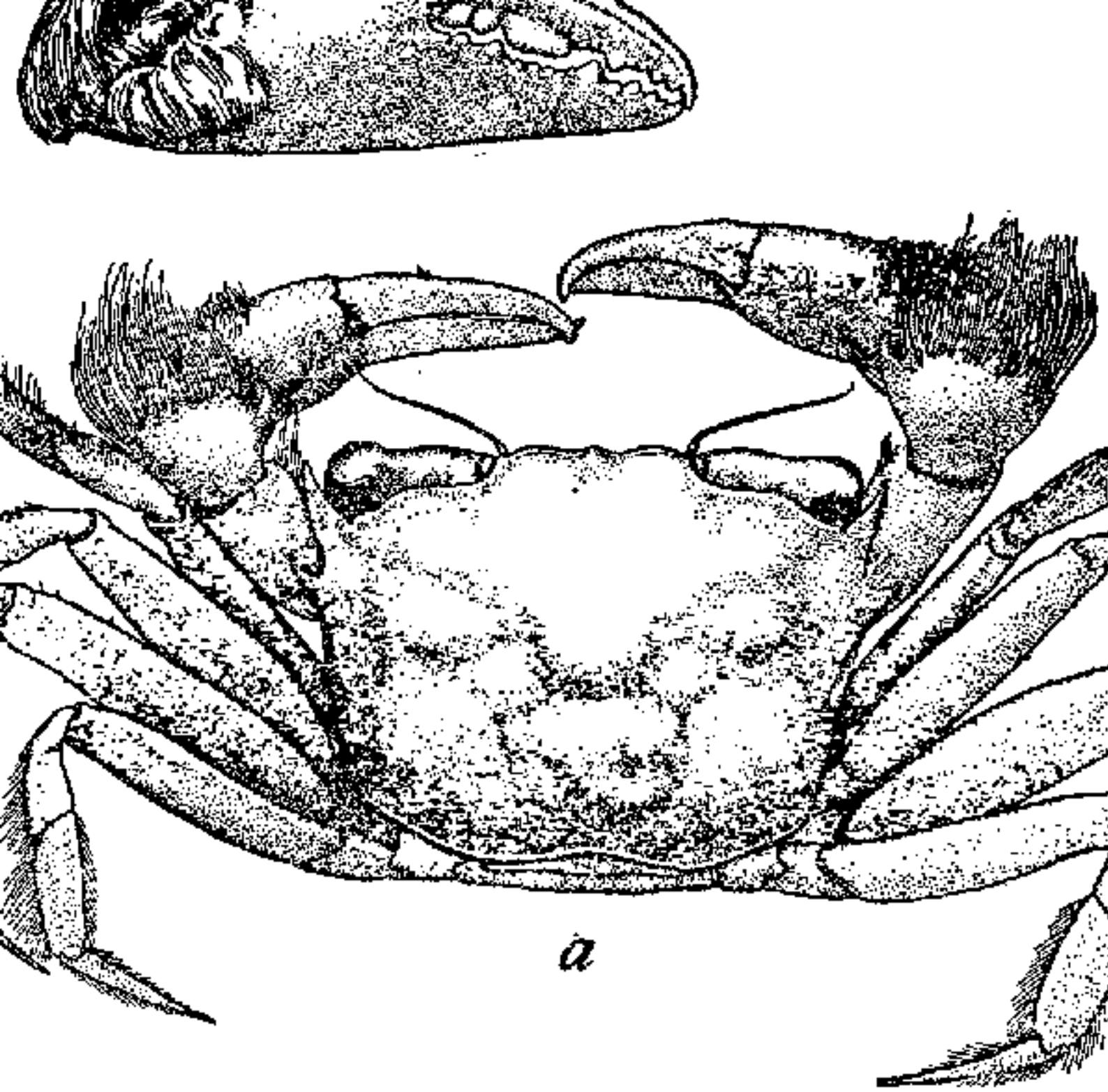
Material.—Off Grenada; lat. $11^{\circ} 25' 00''$ N.; longitude $61^{\circ} 15' 00''$ W.; depth 164 fathoms; Co. brk. Sh.; temp. 58.5° F.; Feb. 27, 1903; Brit. Mus. (Cat. No. 4118, M. C. Z.).

GONEPLAX ROSAEA (A. Milne Edwards).

rosaea A. MILNE EDWARDS, Bull. Mus. Comp. Zool., v. 29, p. 122, pl. 10, fig. 1 (type-locality, St. Vincent, 88, correctly 87, fathoms, 1903; holotype in Paris Mus.).

—Sides almost parallel. Two lateral spines on each side of the mouth.

Description.—Carapace thicker and narrower anteriorly than posteriorly, the lateral margins being almost parallel. Frontal margin straight. Eyestalks shorter and stouter. The mouth armed by a sharp tooth, behind which there is a



NEPLAX HIRSUTA, COTYPE, $\times 2\frac{1}{2}$. *a*, DORSAL VIEW; *b*, HI
CARPUS, OUTER VIEW. (AFTER BORRADAILE.)

otion.—Carapace about two-thirds as long as width between tips of postorbital spines; its rear except for a pronounced H-shaped depression in converging backward from the sharp extraor each of which, and nearer to it than in *G. rhombus*, very sharp spine. Front almost straight, wi

ridentata A. MILNE EDWARDS, Bull. Mus. Comp. Zool., 16 (type-locality, Barbados, "7½ to 50" fathoms, st. holotype in Paris Mus.).

—Three lateral teeth. Two spines on wrist.

—Antero-lateral teeth 3. Wrist armed with one other outside. No tufts of hair on the cast pair of feet styliform.

.—Female holotype, length of carapace 5, width

ty.—Barbados; lat. $13^{\circ} 11' 25''$ N.; long. 59° S.; Co. S. brk. Sh.; Mar. 8, 1879; station 287; Specimen in Paris Mus.

Subfamily PRIONOPLACINAE Alcock.

nac Alcock, Journ. Asiat. Soc. Bengal, vol. 69, 1902.

n the Carcinoplacinae in the form of the male a broad enough at the third segment to cover all the last pair of legs. Some of the genera appear in the form of the carapace which, however, greatest breadth at the orbital angles.

the American Gonoplacidae are referable to the

Genus PRIONOPLAX Milne Edwards.

MILNE EDWARDS, Ann. Sci. Nat., ser. 3, Zool., vol. 18, 1.

PRIONOPLAX ATLANTICA Kendall.

Plate 6, figs. 1 and 2.

Onopla *atlanticus* KENDALL, Bull. U. S. Fish Comm., (1891), p. 305 (type-locality, lat. $25^{\circ} 23' 00''$ N.; long. 23 fathoms; holotype male, Cat. No. 15272, U.S.N.M.).

Diagnosis.—Nearly naked. Three side teeth. Front not projecting below the lower margin of the outer angle of wrist.

Description.—Carapace smooth and shining, very fine lines on sides, regions scarcely indicated; almost flat

side, convex aften; sides converging.

Front width of anterior margin lobes convex slightly. Orbita sloping backward. Margin slightly lower margin hollowed cornea, a



a

b

—**PRIONOPLAX ATLANTICA, MALE HOLOTYPE.**
CERATUM AND PART OF STERNUM, $\times 8$; *b*, OUTER
EDGES, DOTTED LINE MARKING MEDIAN AXIS,

nt much shorter; third not reaching the coxae with the fourth and fifth.

nts.—Male holotype, length of carapace 6, length of front 3.2 mm. Female, Tortugas, length of same 13.5 mm.

West and south coasts of Florida; 10 to 23 fathams examined.—

of Florida; lat. $25^{\circ} 23' 00''$ N.; long. $82^{\circ} 43'$ Sft. gy. M.; temp. 66° F.; Feb. 26, 1889; stat. male holotype (15272).

Tortugas, Florida; dredged; 1 female (Mus. S. U. I. nnel, Key West, Florida; 10 fathoms; 1916; J. Hale (49649).

PRIONOPLAX CILIATA Smith.

spinicarpus STIMPSON, Ann. Lyc. Nat. Hist. New York, 59. Not *P. spinicarpus* Milne Edwards.

ciliatus SMITH, Trans. Connecticut Acad. Arts and Sciences, 160 (type-locality, Panama; type in P.M.Y.U.).¹

—Margin hairy. Four side-teeth. Front, seen g below the lower margin of the orbit. No f wrist.

.—Carapace very convex longitudinally, scarcely. Surface thickly beset with small tubercles between the granules smooth and shining. Separated by a very distinct smooth sulcus, which

upper edge angular, not creased, margins concaved, coarsely and irregularly toothed, not thickly hairy along the edges, especially on the long, very slender, and cylindrical. Ovarium granulous. Abdomen of male smooth, first segment much wider than the second, penultimate segment, its sides deeply concave.

Measurements.—Length of carapace of male cotype .9 mm.

e.—Panama (Stimpson, Smith). Guayaquil, Ecuador.

Genus TETRAPLAX Rathbun.

aplex RATHBUN, Bull. U. S. Fish Comm., vol. 20, for p. 9; type, *T. quadridentata* (Rathbun).

pace quadrilateral; lateral margins dentate, strong posteriorly. Front about one-third the width of the head, nearly straight. Orbital margins nearly transverse, longate and of moderate thickness. Antennae short, thick, slightly sinuate. Buccal cavity wider in front than behind; mouth large, filling it, outer angle not produced, inner

pedes unequal, heavy, angular; fingers pointed.
g, slender, compressed; dactyls of last pair con-
ward.

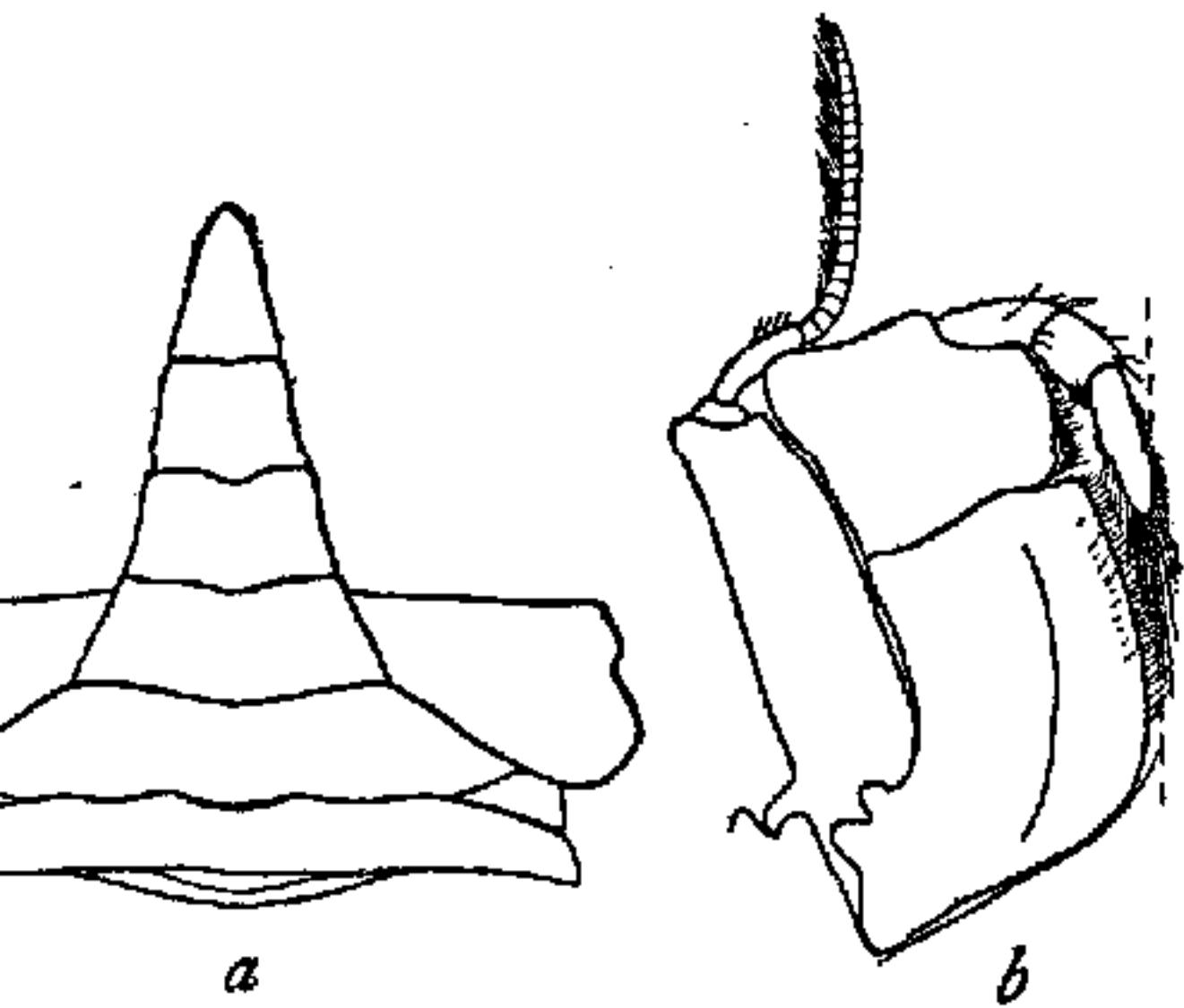


FIG. 9.—TETRAPLAX
DENTATA, MALE
OUTER MAXILLIPED
IN APPROXIMATION

backward to outer orbital toward inner end, and anter tooth; inferior margin next the outer tooth and a angle between which and the front there is a triangular side of which is formed by the outer margin the antenna. Antero-lateral margin with 4 teeth, finely denticulate; the last three teeth are very parallel to the median line; orbital tooth less pro-

Postero-lateral margins longer than antero-lateral, and moderately convex.

Chelipeds subequal. Merus with spine on superior margin at distal third. Carpus with an inner spine and a posterior fringe of hair. Hand smooth, shining, finely granulate above, lower margin acute, very finely granulate, fringed with hair. Lower outer margin of pollex with a granulated costa. Tylus with two superior granulated areas and a superior fringe of hair. Fifth segment of male abdomen narrower than the third. The sutures between the third, fourth, and fourth and fifth segme-



—*EURYPLAX NITIDA*, MALE (15012). *a*, ABDOMEN
PART OF STERNUM, $\times 3\frac{1}{2}$; *b*, OUTER MAXILLIPED,
ED LINE MARKING MEDIAN AXIS, $\times 5\frac{1}{2}$.

segment narrow and little developed; second segment covering the sternum.

American genus. Analogous species on opposite continent: *nitida* (Atlantic); *polita* (Pacific).

KEY TO THE SPECIES OF THE GENUS EURYPLAX.

ero-lateral margins converging anteriorly-----
ero-lateral margins parallel

Lat. N.	Long. W.	Fath.	Bottom.	Temp.	Date.	Sta.	Colle.
• 10	• 10	30	9 ¹ sdv. grassy. rky.	17° C.	Dec. 1883	H. Her. Fish H	
28 59 15	83 32	00	3 R. Co. Sh.	15.5° C.	Nov. 27, 1901	7175	
28 57 30	82 58	15	10 rky. G.	17° C.	Dec. 9, 1901	7207	do
28 50 15	83 23	06	8 ² sdv. brk. Sh.	18° C.	Nov. 28, 1901	7187	do
28 19 45	83 06	30	5 ³ hard. brk. Sh.	13° C.	Jan. 24, 1902	7240	do
28 08 00	82 57	00	5 ⁴ fine, wh. S. bk.	15° C.	Jan. 23, 1902	7220	do
27 43 30	82 52	30	28 {sp. brk. Sh.	Mar. 18, 1885	7262	do	
26 47 30	83 25	15			2410	Albatross	
25 09 52	81 21	63	3 ¹ gry. S. Sh. hard. S.	23.5° C.	Jan. 27, 1903	7429	H. Her. Fish H
24 44 50	81 53	38	10	19.5° C.	Feb. 24, 1902	7352	
					Dec. 1883	7289	D. S. J.
						7289	H. Her. Fish H
						7466	do
						688	J. B. H. son. Fish E
Pt. Minala Lighthouse SSW. 4 W. 5 ¹ mi.		14	Co. S. Sh.	25.0° C.	Feb. 8, 1898	688	

Last lateral tooth not developed.

e pilose. Ambulatory legs slender.
pace of female narrower. Chelipeds more
without pit and surrounding hair.

r.—Distal half of fingers white.

surements.—Male (15012), length of carapace
4.9 mm.

ge.—Florida Keys, Gulf of Mexico and West Indies,
to 49 fathoms.

aterial examined.—See page 35.

alities recorded.—Key West, 2 to 5 fathoms,
49 fathoms (Stimpson); Sarasota Bay (King
Smith); New Orleans (M. C. Z.); St. Thomas

EURYPLAX POLITA Smith.

Euryplax politus SMITH, Trans. Connecticut Acad. Arts
1870, p. 163 (type-locality, Panama; type in P.M.Y.U.).

agnosis.—Antero-lateral margins parallel. Arm
deep pit. Fingers brown at tips.

Description (after Smith).—Carapace glabrous, co
and very slightly transversely. Dorsal surface
ed, although the cervical suture can be traced
on. Front nearly straight, a distinct marginal
edge, and each side deeply notched at the i
ae. Antero-lateral margins parallel, very sh
acute teeth. Postero-lateral margins slightly

border about four-fifths the width of the carapace, separated from the orbital angle by a furrow. Eyes large; lower margin of orbit with a large outer lobe. Antennae not reaching the front, flagellum slightly longer than scape. Mouth parts well developed. Buccal cavity widening a little anteriorly. Chelicerae of medium size (left not known). Legs long, slender. Abdomen of female very broad, but not considerably wider than the sternum; third segment narrower than the second. In the male these segments have a similar relative width.

Chasmophora, from which it is separated by the antennae entering the orbit, is represented by one species.

CHASMOPHORA MACROPHTHALMA (Rathbun).

Chasmophora macrophthalma RATHBUN, Proc. U. S. Nat. Mus., vol. 43, p. 103, pl. 43, figs. 3 and 4 (type-locality, Panama Bay, 51½ fms. deep, female, Cat. No. 21591, U.S.N.M.).

Chasmophora macrophthalma RATHBUN, Proc. U. S. Nat. Mus., vol. 43, p. 103, pl. 43, fig. 5 (male, Cat. No. 21592, U.S.N.M.).

Antennae entering the orbit. Buccal cavity and mouth parts well developed. Carapace broad, subcylindrical, slightly compressed laterally—Length three-fifths of breadth. Regions of carapace nearly level transversely for the middle third, then becoming gradually elevated, oblique, and ending in a sharp point. Orbit large, filling the angle between the carapace and the chelicerae. Lower margin of orbit with a large outer lobe. Antennae not reaching the front, flagellum slightly longer than scape. Mouth parts well developed. Buccal cavity widening a little anteriorly. Chelicerae of medium size (left not known). Legs long, slender. Abdomen of female very broad, but not considerably wider than the sternum; third segment narrower than the second. In the male these segments have a similar relative width.

b

a

—CHARMOPHORA MACROPTHALMA, FE
HOLOTYPE. *a*, CARAPACE, EYES AND AN
TE, DORSAL VIEW, $\times 5\frac{1}{2}$; *b*, RIGHT CHELA,
VIEW, $\times 7\frac{1}{2}$.

of dark blue.

Measuremen

holotype, leng
3, width of san

Material exa

ma Bay; lat.

$9^{\circ} 41' 30''$ W.; $51\frac{1}{2}$ fathoms; gn. M.; March
03, *Albatross*; 1 female holotype (21591).

Genus SPEOCARCINUS Stimpson.

carcinus STIMPSON, Ann. Lyc. Nat. Hist. New York, v
type, *S. carolinensis* Stimpson.

pace subcylindrical. Fronto-orbital width three-fifths of the entire width. Antero-lateral margin angular; postero-lateral margins parallel or slightly so. Eyestalks small, filling the orbits. Mouthules transverse. Basal joint of antenna reaching the front, the next joint standing in the orbital hiatus. Epistome narrow except the middle. Buccal cavity strongly produced anteriorly, maxillipeds gaping, the chela as long as broad, its antero-external angle prominent.

Chelipeds moderately unequal, much stronger than the legs.

FIG.
MA
TE
OF
SU
W
TE
X

Plate 8; plate 159, fig. 6.

carolinensis STIMPSON, Ann. Lyc. Nat. Hist. New York, 1859, pl. 1, figs. 1-3 (type-locality, Charleston Harbor; extant).—RATHBUN, Bull. U. S. Fish Comm., vol. 2, 1901, p. 11, text-fig. 2.

Eyestalks constricted. Antero-lateral teeth nearly smooth.

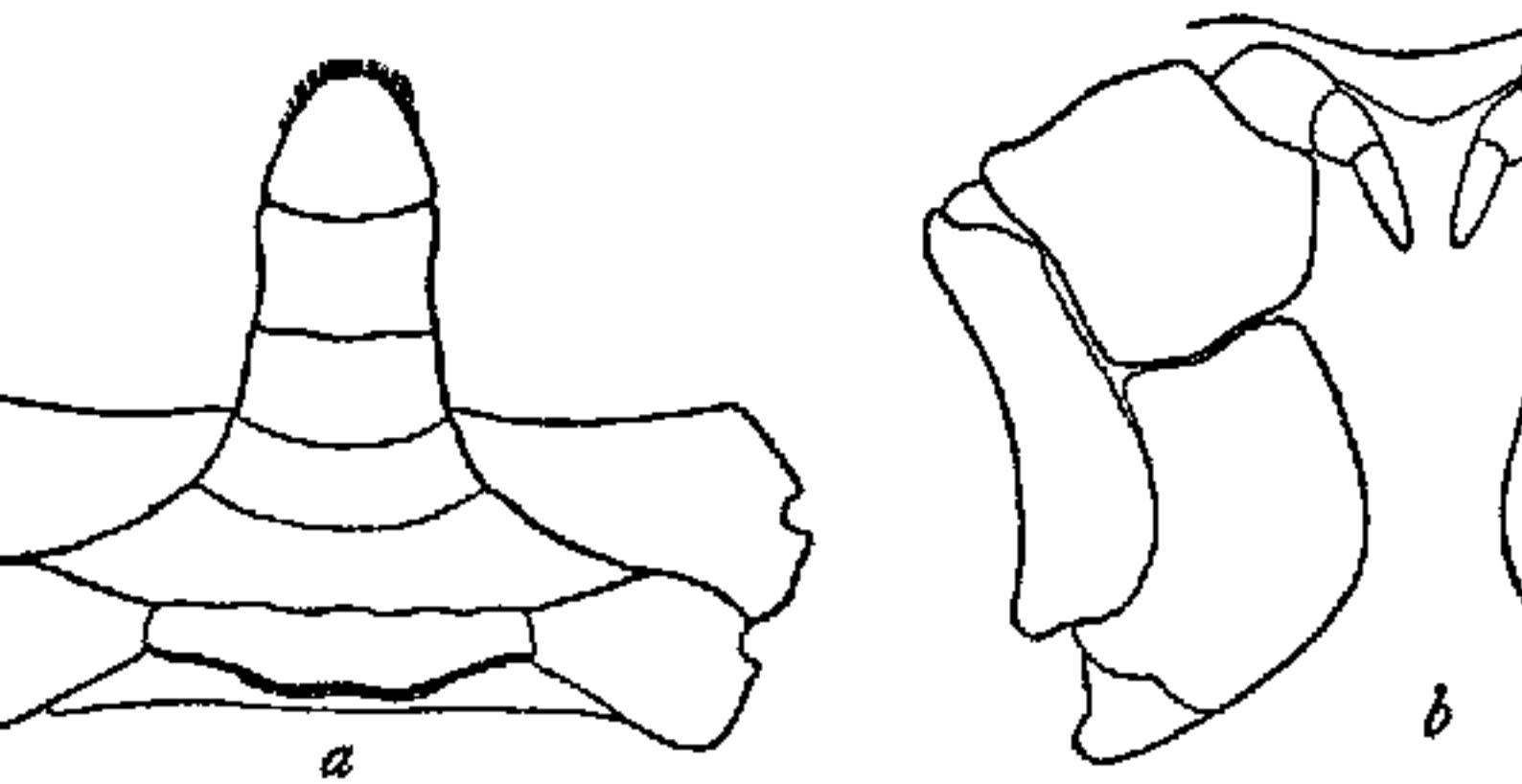
—Carapace nearly smooth, punctate, obscurely granulated; margins, pubescent. Gastric region and its sides rounded. Antero-lateral margin 5-toothed, including the orbit; second tooth rounded and not always distinct from the first; last three teeth sharp and moderately acute. Postero-lateral margins parallel. Front about one-third of carapace, edge nearly straight, a little sinuous near emargination. Eyestalk constricted next the antero-external angle of merus produced outwards, blunt, nearly smooth, margins hairy. A strong spine near summit of merus. Inner margin of cheliped with a blunt tooth at inner angle. Outer surface microscopically granulated. Dactylus of large claw smooth at base. Legs with hairy margins.

—Male, Charleston, length of carapace 23.2 mm.

This crab lives in the subterranean galleries ex-

s; Co. S.; temp. 26° C.; station 6074, *Fish H*
(23766).

Thomas; 1 male (Copenhagen Mus.).



14.—*SPEOCARCINUS GRANULIMANUS*, MALE HOLOTYPE. *a*, ANTERIOR STERNUM, $\times 3$; *b*, OUTER MAXILLIPEDS, SHOWING APPROXIMATELY

SPEOCARCINUS GRANULIMANUS Rathbun.

Plate 9.

Speocarcinus granulimanus RATHBUN, Proc. U. S. Nat. M.
p. 242 (type-locality, lat. 30° 21' 00" N.; long. 114°
fathoms; holotype male, Cat. No. 17461, U.S.N.M.).

Diagnosis.—Eyestalks tapering. Antero-lateral teeth granulate.

Description.—Carapace with large punctae, distinct near the margins; regions well marked.

Plate 10, fig. 1.

Speocarcinus ostrearicola RATHEUN, P.

Nat. Mus., vol. 38, 1910, p. 545, pl.

Capon), Peru; holotype male, Cat.

(type-locality, oyster beds of Mata-

U.S.N.M.).

Diagnosis.—Eyestalks constricted.
lateral teeth four, well-marked.
nearly smooth.

Description.—Body and legs coarse
carapace very broad, coarsely granu-
gions fairly well marked. Antero-late-
gin cut by broad V-shaped notches
well-marked teeth. Front one-fourth
as carapace, having a deep median
edge bilobed, lobes arcuate. Eyestalk
slender, corneae somewhat enlarged.

Chelipeds unequal, broad, nearly si-
tooth on upper edge of arm and in-
wrist; palm high, upper margin granu-
gers narrowly gaping, inner margin
larly dentate; upper margin of dactyl
late, immovable finger with a raised,

te, last tooth acute. Postero-lateral margins behind. Front with straight edge, slightly emarginate, one-fourth width of carapace. Eyestalk flat above, longer than in *granulimanus*. Antero-exterior margin of maxilliped not produced outwardly, but the outer corner thickened.

Revoluta

Chel

smooth

margin

granulo

and can

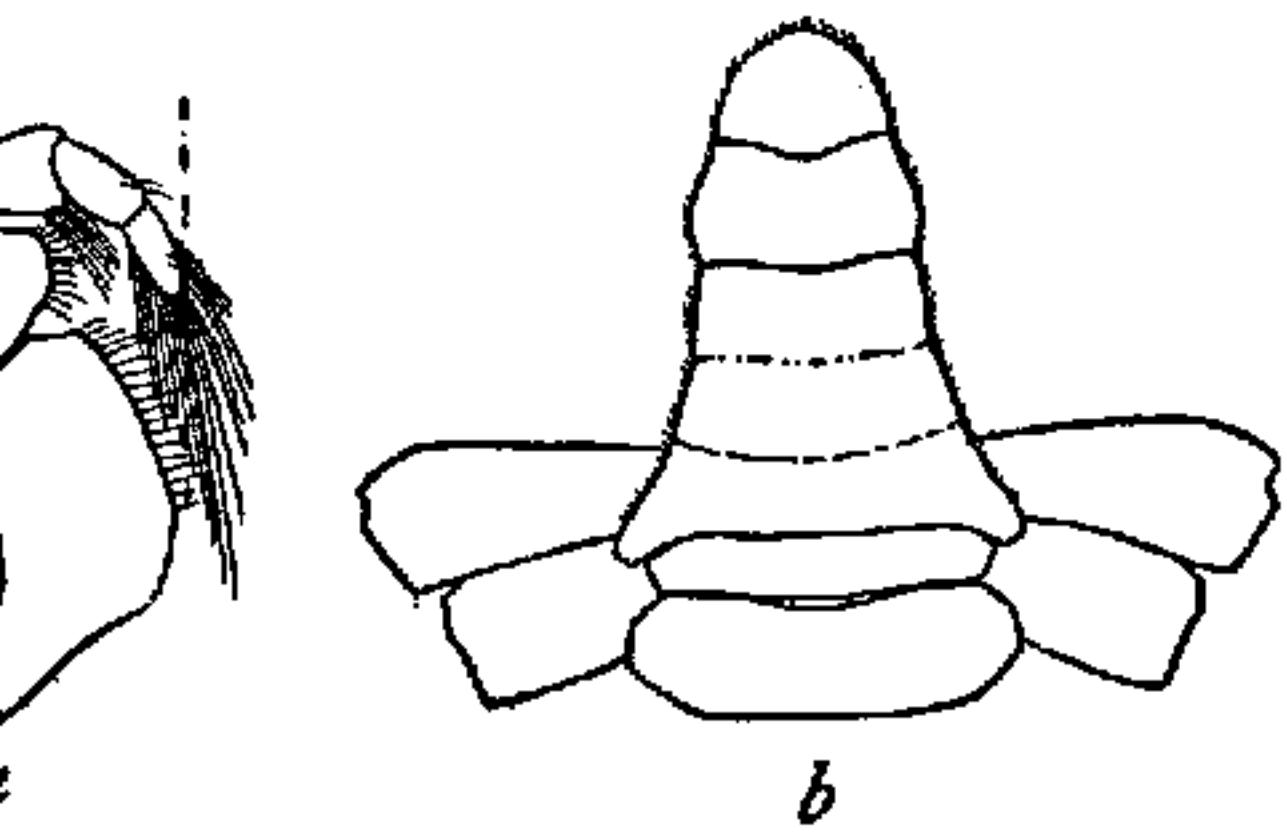
a stout

stylus o

with o

basal t

fringed



-**SPEOCARCINUS CALIFORNIENSIS, MALE (32966).**
a, HEAD AND FIRST TWO SEGMENTS OF BODY; b, ABDOMEN AND PART OF STERNUM, $\times 23$.

Measurements.—Male (45581), length of carapace 6 mm.

Habitat.—San Pedro to San Diego, California.
Material examined.—

Localities: San Pedro: H. N. Lowe; 1 male (19731); 1 male (32966). Venice: Venice Marine Biol. Station; 1 male (45581). San Diego: San Diego Bay; H. N. Lowe; 1 male (19731).

14, fig. 3.

Pseudorhombila octodentata
UN, Proc. Biol. Soc.
ington, vol. 19, 1906,
ype-locality, Domin-
otype male, Cat.
900, U.S.N.M.).

—Antero-lateral
ate. Wrist sub-

Abdomen of male with third to fifth segments
ing the sternum at the third segment.

.—Carapace very convex fore and aft, region
d, surface closely set with flattened granules;
a V-shaped median notch, a rounded lobe at out-
I teeth four (orbital angle excluded); the first
separated from the orbit by a

straight interval; second widest; third and fourth
acute, the third the largest, the fourth the most projecting.

Chelipeds (the right one)
strong, covered with finely
lulated granulation; merus
ing little beyond the body.

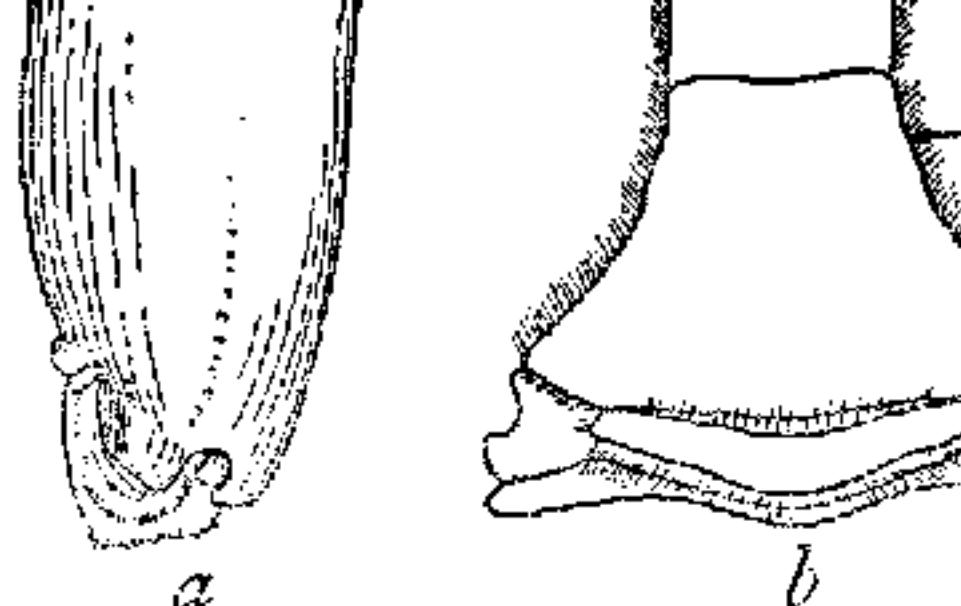


FIG. 17.—*PSEUDORHOMBILA OCTODENTATA* HOLOTYPE. *a*, RIGHT CHELA, OUT X 10; *b*, ABDOMEN, PART OF STERNUM AND COXA OF LAST LEG, X 13.



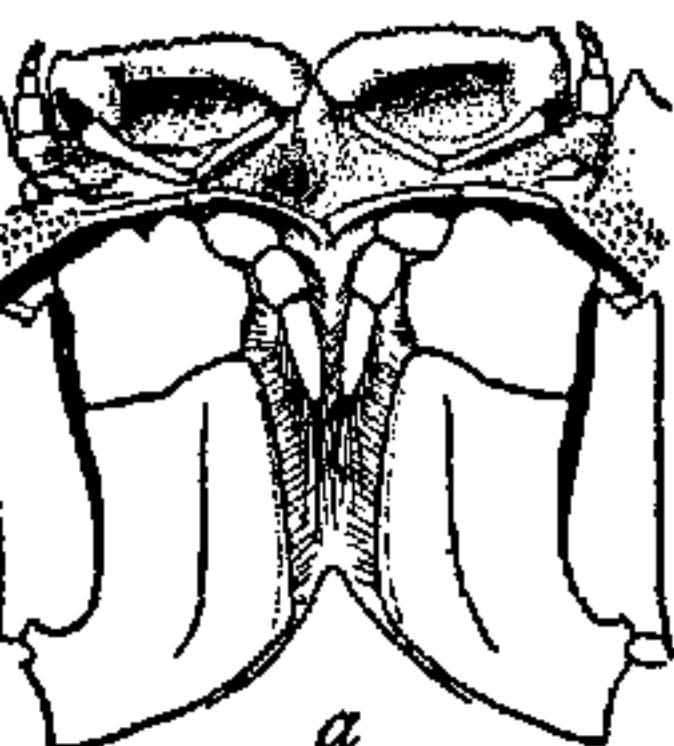
here Day, Dominica; 100 fathoms, II. II. Verreaux
2690).

nique; 1 male, 2 females (Paris Mus.).

Genus OEDIPLAX Rathbun.

Oediplax RATHBUN, Proc. U. S. Nat Mus., vol. 16, 1893, p. 11.
granulatus Rathbun.

Very related to *Pseudorhombila*, but more xanthous,
the pro-lateral margin being longer and the posterior



OEDIPLAX GRANULATA, FEMALE HOLOTYPE. *a*, ANTENNAL AN-

$\times 2\frac{1}{2}$; *b*, RIGHT CHELA, OUTER VIEW, $\times 1\frac{1}{2}$.

and the wrist not obliquely quadrilateral. The head is arched, the front is less than one-fourth as wide as the hind, and the buccal cavern does not widen anteriorly. The abdomen is brown, but it is probable that, as in the female, the sternum between the legs.

a stout subhepatic spinule. Carapace widest at
of female moderately unequal, rough, with la-
nged partly in rows. A subdistal spine on upper
stout inner carpal spine, with a small spine
late above for half its length, fingers narrow-
law, a low, stout tooth at base of dactylus. Legs
spinulous above.

3.—Female holotype, length of carapace 32.5,

examined.—Gulf of California; off Consag Rock,
lat. $31^{\circ} 06' 45''$ N.; long. $114^{\circ} 28' 15''$ W.; 33
o. 63.8° F.; Mar. 27, 1889; station 3031, *Alb*
holotype) (17465).

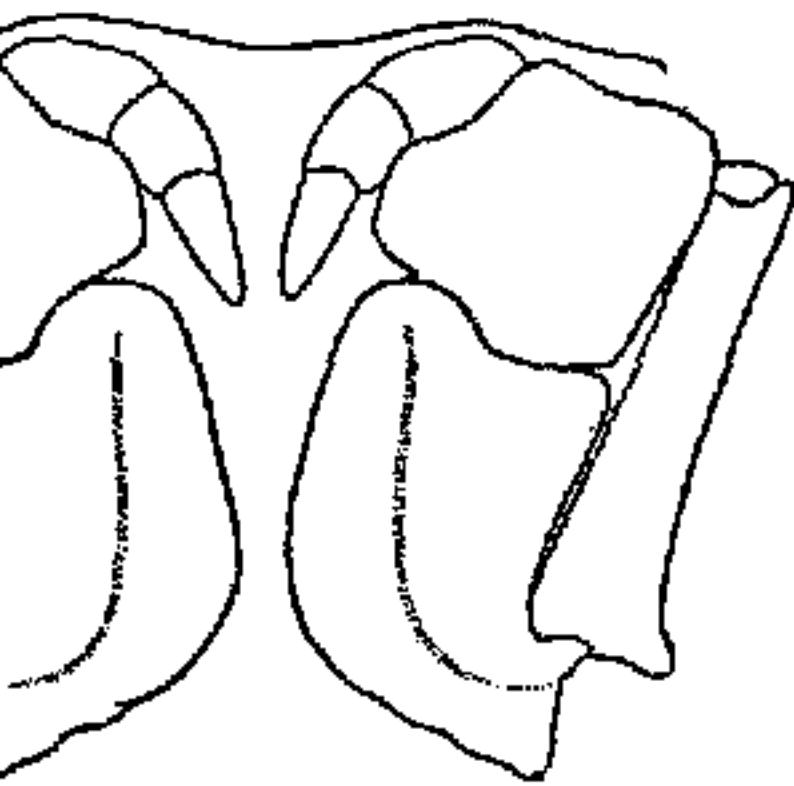
Genus CYRTOPLAX Rathbun.

RATHBUN, Proc. U. S. Nat. Mus., vol. 47, 1914, p.
videntata (Benedict).

much broader than long, convex longitudinally.
Regions well marked. Antero-lateral margin
postero-lateral converging. Fronto-orbital width
of carapace. Front advanced, lobes convex by a furrow from the orbital margin. Eyes rather large. Antennal joint rather broad, inner angle just touching standing in the orbital hiatus. Buccal cavity

abdominal segment narrower than the sternum.

Description.—Carapace more convex longitudinally, lateral teeth upturned. Front between a third width of the carapace, deflexed, lobes slightly conical-shaped. The orbits trend forward and outward, a shallow lobe between upper fissures; below outer angle, a large feeble inner tooth is low the middle of which is narrow exceeding and fits snugly in the five antero-lateral, second is lobiform and from the orbital angle sinus; third tooth truncate; fourth antero-lateral, form, subequal; ca-



CYRTOPLAX SPINIDENTATA, MALE
THE OUTER MAXILLIPEDS, SHOWING
PROXIMATION, X6.

last tooth. Postero-lateral margins moderately provided with a strong superior subterminal deep sulcus parallel to the margin next the palmines at the inner angle, one below the other, however. The palms are convex above and below, and is granulate. The fingers are slender, much curved inward; the dactyli are granulate above at the

s; 1872; Krebs, coll.; 1 specimen (Copenhagen) Jan. 30 to Feb. 2, 1884; *Albatross*; 2 males (763 and, Trinidad; Jan. 30 to Feb. 2, 1884; *Albatross*

Genus PANOPLAX Stimpson.

STIMPSON, Bull. Mus. Comp. Zool., vol. 2, 1871, p. 151
a Stimpson.

arcuate anteriorly, quadrate posteriorly; deeper than long, regions distinct. Fronto-orbital width equal to the entire width. Frontal lobes convex, well separated at the midline, rounded at the distal angles. Antero-lateral margin dentate.

Basal antennal joint just touching the front of the head in front of the orbital hiatus. Antennules transverse, sides parallel. Merus of maxillipeds broader than the rest, unequal; wrists obliquely subquadrate.

o fifth segments of the abdomen of the male always not reach the coxae of the last pair of legs, which is about one-half the width of the sternum.

ward those xanthoid genera of which *Panoplosoma* contains but one species.

PANOPLAX DEPRESSA Stimpson.

Plate 12, figs. 1 and 2.

depressa STIMPSON, Bull. Mus. Comp. Zool., vol. 2, 1871, p. 151.

rown, color not extending to palm; prehensile
large one at base of dactylus; no gape. In t

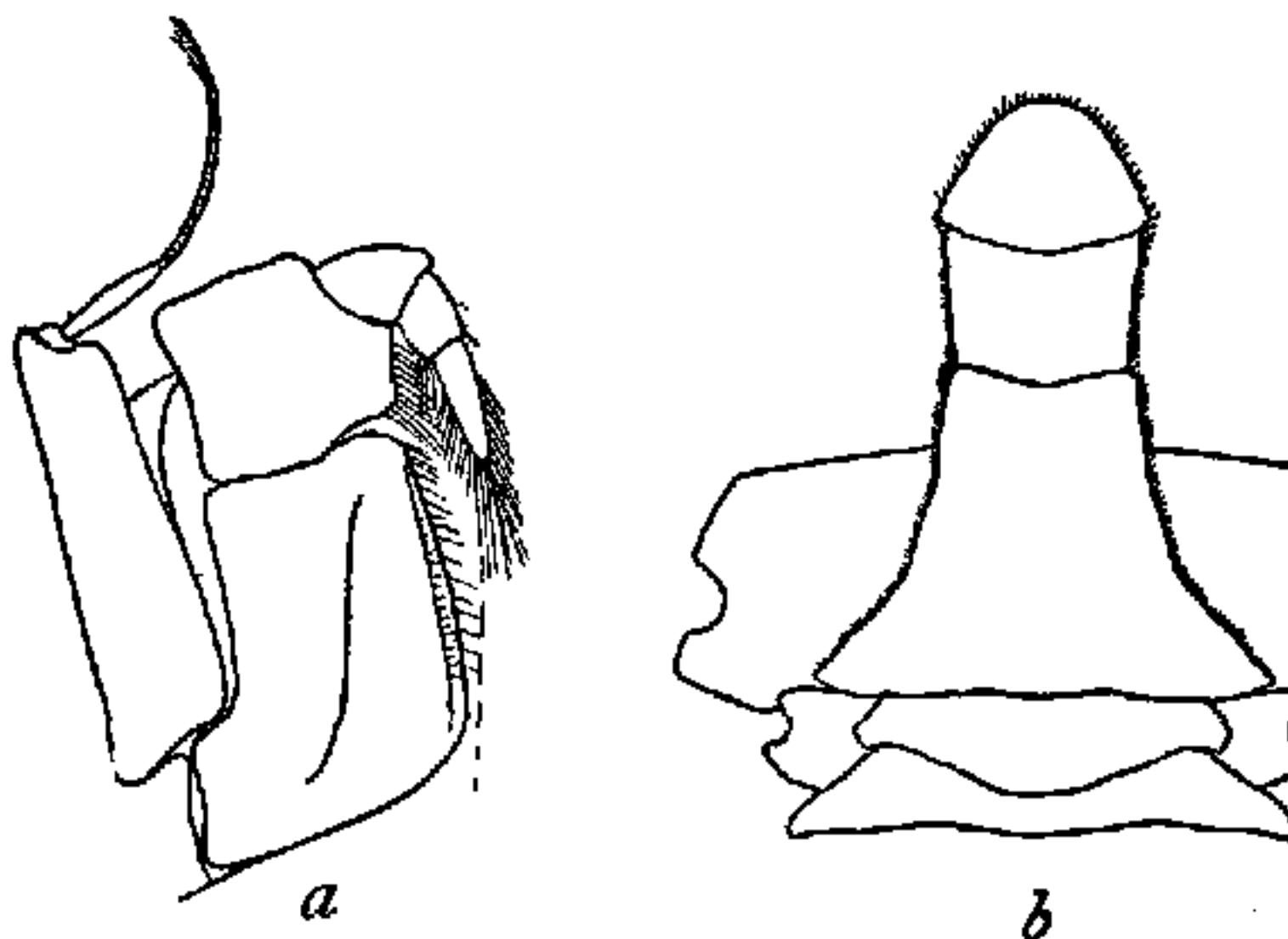


FIG. 21.—*PANOPLAX DEPRESSA*, MALE (25624). *a*, OUTER CHELIPEL, $\times 9$; *b*, ABDOMEN AND PART OF STERNUM, $\times 10$.

surface of the manus is flattened, with traces of carinae and an intermediate furrow. Merus armed on anterior margins, following joints hairy. Measurements.—Male (25624), length of carapace .5 mm.

Habitat.—West coast of Florida to Yucatan Channel. To a depth of 28 fathoms.

Material examined.—See page 49.

*Material examined of *Panoplax depressa*.*

Lat. N.	Long. W.	Fath.	Bottom.	Temp.	Date.	Sta.	Collector
• • "	• • "	28	sdv	66° F	Apr. 2, 1901	7123	<i>Fish Hawk</i>
26 33 00	83 10 00	27	fne. wh. S. bk. Sp.	Mar. 18, 1885	2411	<i>Altistro</i>	
26 33 30	83 15 30	27	fne. gy. S. bk. Sp.	Mar. 19, 1885	2412	do	
26 18 30	83 08 45	27	brk. Sh.	do	do	do	
26 00 00	82 57 30	24	fne. S. bk. Sp.	do	2413	do	
25 04 30	82 59 15	26	brk. Sh.	do	2414	do	
22 18 00	87 04 00	24	fne. wh. S. brk.	Jan. 30, 1885	2365	do	
		5	wh. R. Co.	do	do	do	
		4-6	Co.	68° F	Jan. 20, 1899	6065	<i>Fish Hawk</i>
Custom House, E. 4 N. 4½ m.		71	Co. S. shelly	28° C.	Jan. 25, 1899	9072	do
Cabo Rojo Lt. House SSE., 6½ m.		91	Co.	do	Feb. 14, 1899	6099	do
Hueares NW., ¾ W., 21 m.		do	do	do	Feb. 10, 1899	do	do
Rico		do	do	do	do	do	do

ral margin with five teeth, orbital angle included—
ral margin with four teeth, orbital angle included—

GLYPTOPLAX PUGNAX Smith.

Plate 158, figs. 1-6.

Glyptoplax pugnax SMITH, Trans. Connecticut Acad. Arts
1870, p. 165 (type-locality, Panama; type in P.M.Y.
EDWARDS, Crust. Reg. Mex., 1880, p. 335, pl. 61, figs.

nosis.—Five side teeth, the last one large. No
of palm.

Description.—Carapace slightly convex longitudinally;
rself; thickly granulous. Mesogastric lobe
minent protogastric lobes. The epigastric lobes
separated by a marked median sulcus. Hepatic
set off by deep sulci. Mesobranchial and metabranchial
ed by a very slight sulcus, while the anterior
ial region is divided into three lobules, one at
branchial tooth, a large one just within this, and
the next the gastro-cardiac sulcus.

Anterior margin thin, horizontal, edge slightly convex, a small
angle of orbit a prominent tooth; two deep no-

Antero-lateral margins arcuate; the outer angle
is only slightly beyond the second tooth and is
a slight sinus. In addition, there are three promi-

h. of which the middle one is most prominent.

Sexual variation.—The females are convex than the males and the front prominent and slightly deflexed.

Measurements.—Male, Panama, length carapace 8.6, width of same 12.1 mm. (Smith).

Range.—Costa Rica; Panama (Smith).

Material examined.—Punta Arenas, Rica; specimens in Copenhagen Museum.

GLYPTOPLAX SMITHII A. MILNE EDWARDS.

Plate 13, figs. 3 and 4; plate 158, figs. 7–10.

Glyptoplax smithii A. MILNE EDWARDS, Crust.

Mex., 1880, p. 336, pl. 61, figs. 4–46. Type locality, reefs west of Florida, 13 fms. (type in M.C.Z.).

Diagnosis.—Four side teeth, the last small. A lobe on upper edge of palm.

Description.—Closely related to the preceding. The carapace is slightly convex dorsally, the lateral teeth upturned. The teeth of the front are truncated and slope backward and outward, except at the blunt and blunt outer angle. Lateral teeth the normal second tooth of the antero-lateral row, and the third tooth of the

Eucratopsis SMITH, Amer. Jour. Sci., vol. 48, Nov., 1869.
E. crassimanus (Dana); Trans. Connecticut Acad. A
1869, p. 35 (dated "August," but issue destroyed by
button, and not reprinted until November).
Eucratopla A. MILNE EDWARDS, Bull. Mus. Comp. Zoöl.,
type, *E. guttata* A. MILNE EDWARDS = *crassimanus* (Dana).
Cephalothorax narrow, panopeoid; regions plainly marked;
distance from three-fifths to two-thirds of the total length.
Front prominent, separated by a furrow from the lateral angle. Eyes stout; the three fissures of the lateral margin five-toothed, orbital tooth innermost. Margins moderately convergent. The basal segment of the maxillipedes a prolongation of the front; the flagellum inserted in a deep basal hiatus. The buccal cavity widens somewhat anteriorly. The width of the maxillipeds is not much broader than the width of the body. Maxillipeds very heavy, subequal; palms very high, the lateral angle protuberant. Legs narrow, the first pair considerably shorter than the others. The first segment of the fifth leg reaches across the sternum, the third segment being fused with the two following segments.
The type-species included.

EUCRATOPSIS CRASSIMANUS (Dana).

Plate 12, fig. 3; plate 159, figs. 1 and 2.

are very stout; the merus is as high as it is long, with a blunt, stumpy inner tooth, the anterior margin; anterior unounced. Palms a little under portion of the outer surface aspect broad, sloping, the of the upper margin forming e; the lower margin of the pro sinuous, the pollex very broad tapering rapidly to the tip; bent down; both digits irregular, leaving a narrow gape when

g.—Male holotype, length of width of same 27.9 mm.

The type is much larger than specimens examined; half-grown a wider and less prominent other carapace which is wider in its posterior part, from west coast of Florida to Rio de Janeiro, Brazil, to $7\frac{1}{2}$ fathoms.

named.—

Florida; H. Hemphill; 1 female ovig. (17801); 1



FIG. 22.—*Eucarcinus crassimanus*, (17801), OUTSIDE ILLUSTRATED, $\times 8$.

Subfamily RHIZOPINAE Miers.

Rhizopidae STIMPSON, Proc. Acad. Nat. Sci. Phila., vol. 1
Rhizopinae MIERS, Challenger Rept., Zool., vol. 17, 1880
Journ. Asiat. Soc. Bengal, vol. 69, 1900, pp. 287, 293.
stalks often fixed, corneae small or obsolete; the orbit has a tendency to run downwards towards the carapace usually has its antero-lateral corners cut off; the front may be square-cut and broad or less distinctly bilobed and deflexed. The mandibles fair size and transversely folded, but more or less crimped; the narrowness of the front, they are cramped and sometimes they can not be folded in their fossae and the lacinia usually short. The epistome may either be prominent, or ill defined and sunken. The buccal teeth, but often diminished in breadth anteriorly. The cheliped claws have a square or suboval merus and may be without a basal cavern, or there may be a gap between them which does not nearly cover the space between them. Male openings sternal.

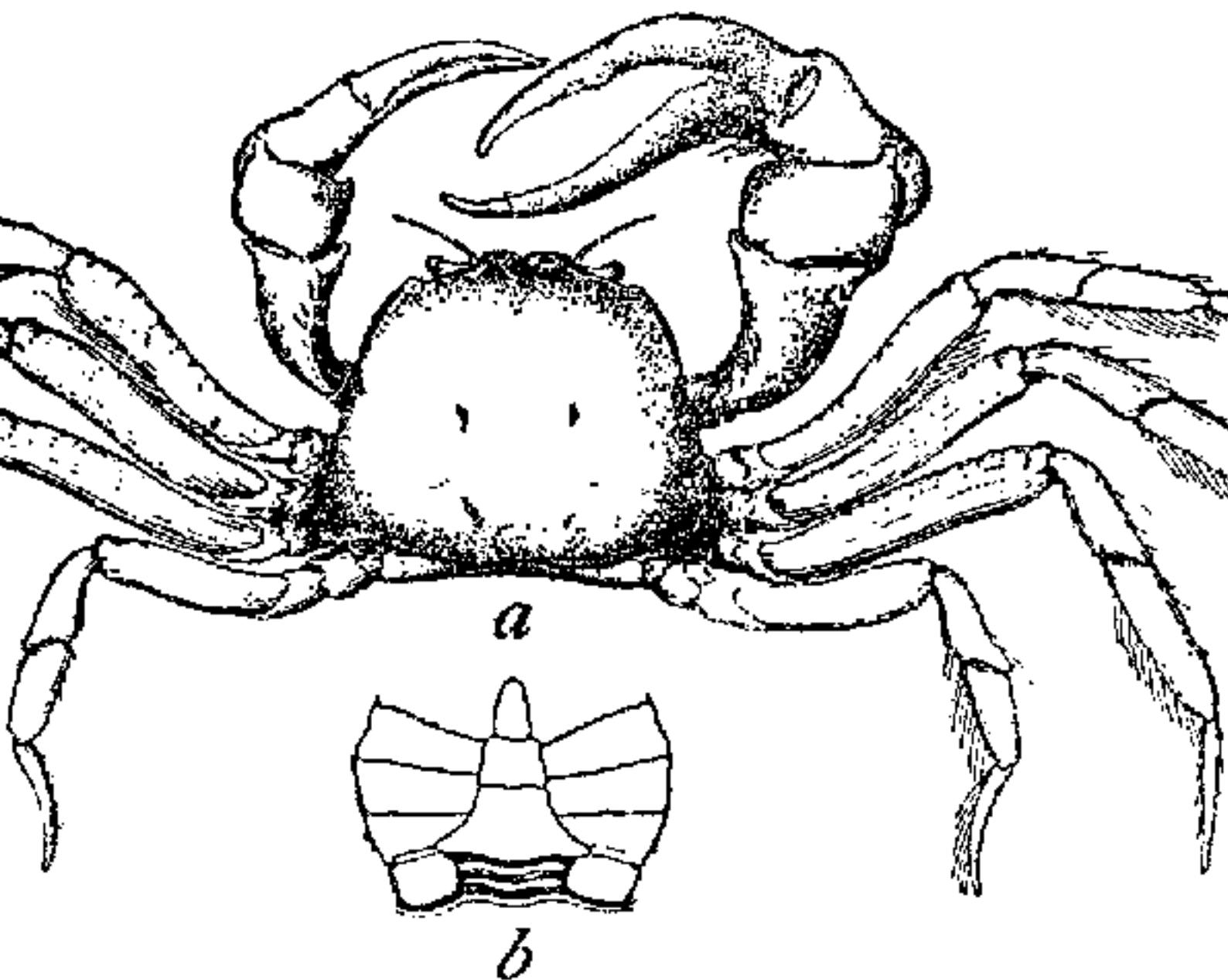
There is only one genus, and that atypical, is found in America.

Genus CHASMOCARCINUS Rathbun.

Chasmocarcinus RATHBUN, Bull. Lab. Nat. Hist. State of New York, 1898, p. 284; type, *C. typicus* Rathbun.

in dorsal view.

- ected obliquely forward and outward. Merus joints
----- *latifrons*
cted obliquely backward and outward. Merus joints
narrow, not much broader than long ----- *obliquus*
broad, much broader than long ----- *cylindricus*



CARCINUS TYPICUS, MALE HOLOTYPE. *a*, DORSAL VIEW, $\times 1$.
DOMEN AND STERNUM, FLATTENED, $\times 2$.

CHASMOCARCINUS TYPICUS Rathbun.

nus typicus RATHBUN, Bull. Lab. Nat. Hist. State Un-

ipeds punctate, for the most part smooth. The larger cheliped has a tooth at the inner angle, blunt in the larger, acute in the smaller. Palms short and broad, convex; fingers very long and slender, strongly bent, acute and bent toward each other. Dactylus of the larger cheliped longer than the pollex and very thick at base, as seen



—CHASMOCARCINUS TYPICUS, MALE
—, OUTER MAXILLAE, SHOWING APPLI-
CATION, $\times 2\frac{1}{2}$.

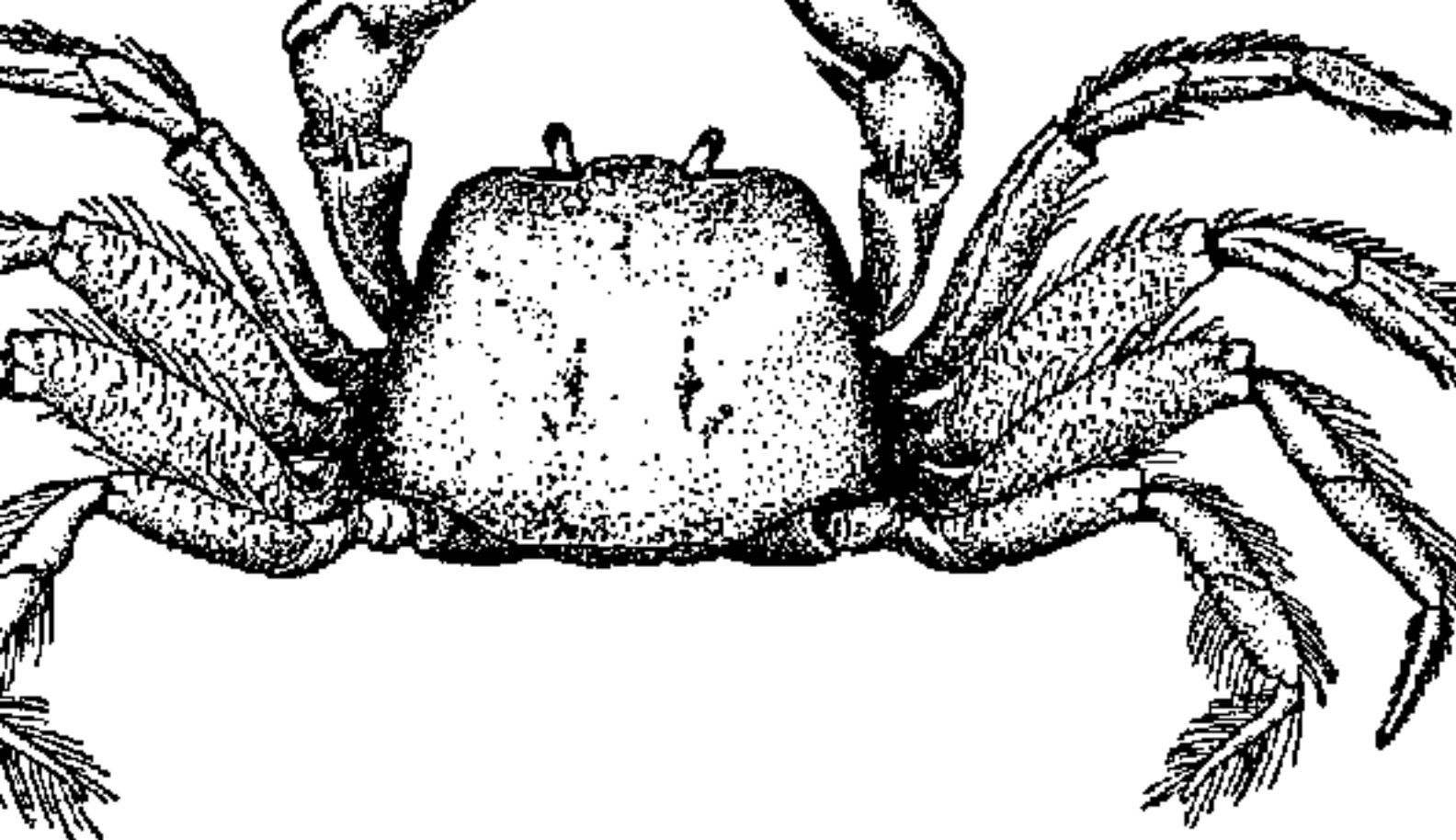
prehensile margin tuberculate and serrated. Prehensile margin of pollex dentice, with a sinus at its base forming a slight angle. Fingers of smaller cheliped slightly longer than those of the larger, gaping, prehensile edges very fine, with a larger tooth at the base of the fingers. The chelipeds of the female are not so much longer than those of the male, the smaller ones resembling the left in character, having a sharp spine and the fingers slightly bent and not gaping.

Mandibular legs somewhat flattened, hairy; dactyls on opposite sides.

Abdomen and sternum granulate. In the male the posterior segment has a supplementary overlying plate on the anterior margin; in the female the posterior segment overlaps only the preceding.

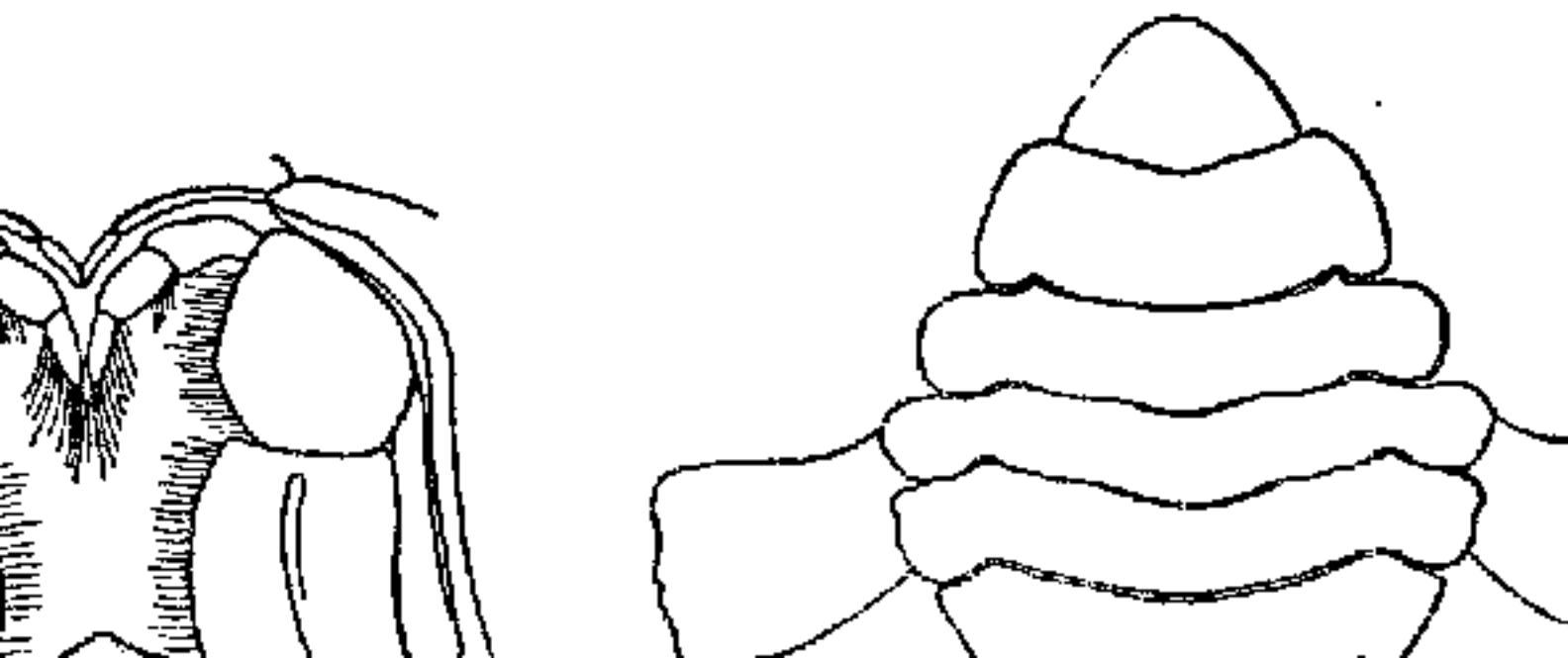
Measurements.—Male holotype, length of carapace 1.8 mm.

Type.—Off Trinidad and Cape Frio, Brazil. 31



—*CHASMOCARCINUS LATIPES*, FEMALE HOLOTYPE, DORSAL VIEW,

—Carapace two-thirds as long as broad. Carapace less than one-half the width of the carapace with large punctae which tend to coalesce; granules becoming smaller toward the center and toward the margins. Two very deep longitudinal impressed lines in the center of the carapace. A



W.; 51 fathoms; gn. M.; May 2, 1888; stat
ss; 1 female (21592).

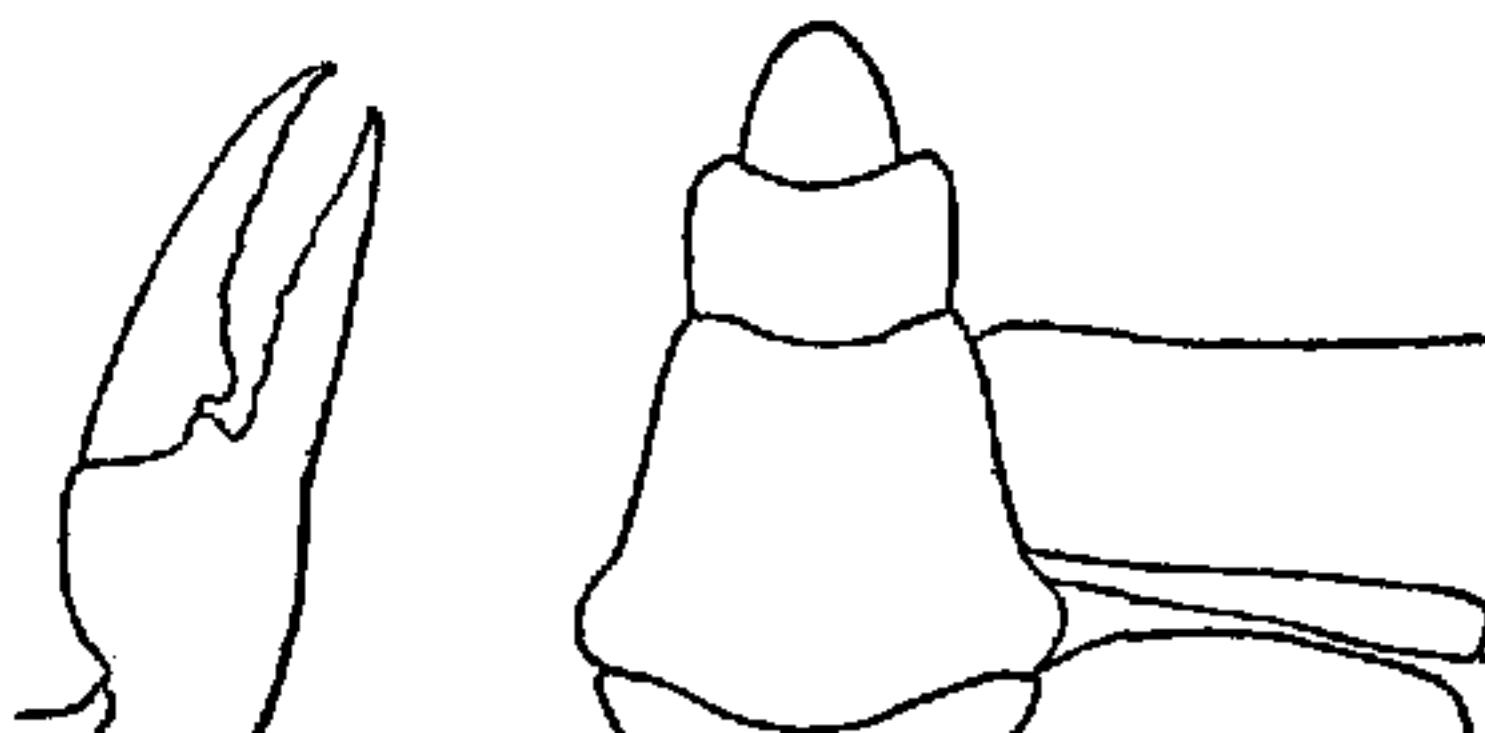
CHASMOCARCINUS OBLIQUUS Rathbun.

Plate 14, figs. 1 and 2.

Chasmocarcinus obliquus RATHBUN, Bull. Lab. Nat. H
Iowa, vol. 4, 1898, p. 286, pl. 7, fig. 6 (type-locality, sou
Island, Bahamas, 97 fathoms, station 2651, Albatross
Cat. No. 20509, U.S.N.M.).

agnosis.—Orbits directed obliquely backward
ce very narrow; no antero-lateral marginal l
lomen smooth.

Description.—Carapace narrow, nearly as long as
lateral margin. Surface smooth, finely and o
Median notch of front shallow. Superior ma



Material examined.—Known only from the type-specimen from southeast of Tongue Island, Bahamas, in Tongue of Old Bahama Bay, at lat. $24^{\circ} 02' 00''$ N.; long. $77^{\circ} 12' 45''$ W., depth 10 fathoms; wh. Oz.; temp. 73.4° F.; 1886; station 2651, Str. *Albatross* (20509).

CHASMOCARCINUS CYLINDRICUS Ra

Chasmocarcinus cylindricus RATHBUN

U. S. Fish Comm., vol. 20, for 1

1901, p. 10, text-fig. 1 (typ).

Mayaguez Harbor, Porto Rico

fathoms, station 8061, *Fish Ho*

type male, Cat. No. 23765, U.S.N.M.

Diagnosis.—Orbits directed obliquely forward and outward. Carapace broadly narrowed in front; an antero-lateral line. Sternum and abdomen greyish.

Description.—Carapace about twice as long as broad, but wider anteriorly than in *C. latipes*. Fronto-orbital width one-half width of carapace. Body cylindrical, almost level from side to side, frontal portion more strongly deflected forward.



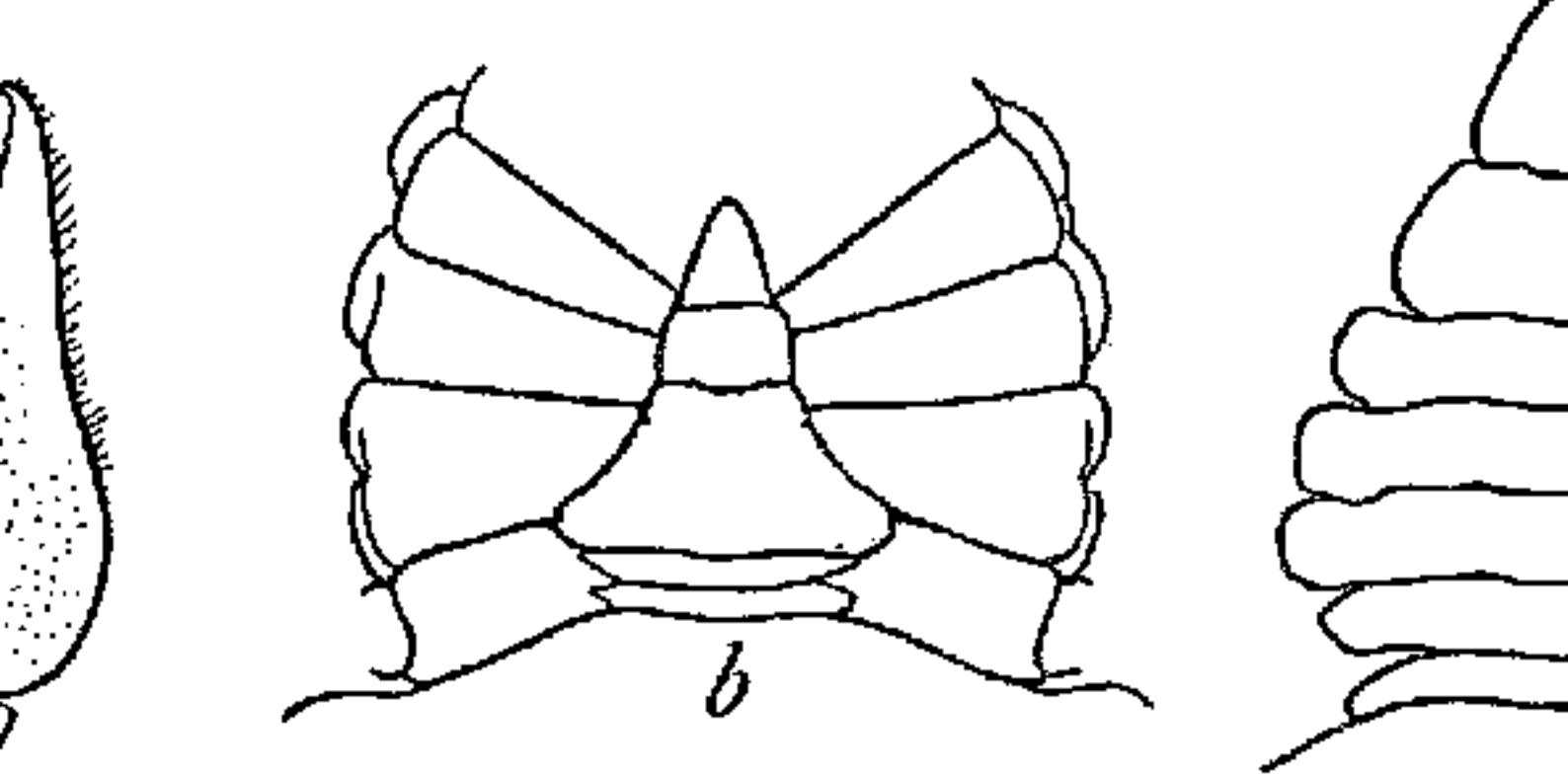
3.—*CHASMOCARCINUS CYLINDRICUS*, FEMALE (24551), DORSAL

its fingers gaping at base; in the female the hand is equal and the fingers do not gape.

carroll, fringed with hair.

Estimate sternal segment of male without a post-

plate.



often very large, is never quadrilateral, and palp distinctly at the antero-internal angle; ischium sometimes absent or indistinguishably fused in which case the merus lies with its long axis almost transversely inwards; exognath small and simple. The interantennular septum, when distinct, a thin plate. Male abdomen very narrow. Male

gills, often living as commensals in bivalve shell worm tubes or on the outer surface of echinoderms and gasteropod mollusks. Some are true parasites on echinoids, many are free-swimming, especially the American genera belong to the two largest subfamilies, the *Pinnotherinae* and the *Pinnothereliinae* (p. 127).

Subfamily PINNOTHERINAE Milne Edwards.

Pinnotherinae MILNE EDWARDS, Ann. Sci. Nat., Zool., ser. 3, vol. [103], restricted.

External maxillipeds either rudimentary or fused with the merus to form a single piece of bone, sometimes almost transverse. Palpus not cheliferous. Carapace usually not markedly transverse.

AMERICAN GENERA OF THE SUBFAMILY PINNOTHERINAE

first 3 ambulatory legs simple, not bifurcate. Palps with basal ridges.

KATHBUN, Amer. Nat., vol. 34, 1900, p. 368, type, *Z.*

oteres ALCOCK, Journ. Asiat. Soc. Bengal, vol. 69, 1900,

les larger than males. Young females similar
pace usually ill calcified in female, often calci-
y convex with ill-defined edges; in shape tra-
lular or subquadrangular to suboctagonal, with
metimes longer than wide; generally surface
not defined, occasionally surface uneven and

narrow, generally deflexed in female, more o-
. Orbita small in female, larger in male, circ-
s short. Antennules oblique. Antennæ small
n standing in inner angle of orbit.

ome well defined. Buccal cavity crescentic, ar-
rom side to side, but very short fore and aft.
pedes completely close the cavity; they consist
which is fused with the ischium to form a sin-
directed joint carrying the flagellum at its inne-
y small, though sometimes large, even half as
it consists usually of three segments, the dactylus
on the inner or flexor border of the propodite
l to the distal end of the propodite; very ex-
consists of only two segments, the dactylus
h for the most part concealed.

pedes short, equal, and generally stouter than
e length. Abdomen consisting usually of s-

lyli of legs unequal, either the second or the fourth longer than the others.

Dactylus of second leg longest.

Manus widest a little behind distal end. Carapace yielding.

1. Dactylus of second leg nearly (about seven-eighths) as long as propodus. *ostreum*

2. Dactylus of second leg shorter, about two-thirds as long as propodus. Legs slenderer than in *ostreum*. *holmei*

Manus widest at distal end.

3. Carapace about one-fifth wider than long. Palm of second leg twice as long as wide. *geddesi*

4. Carapace wider, one-third wider than long. Palm of second leg twice as long as wide. *angusticarinatum*

Dactylus of fourth leg longest.

Carapace suborbicular, front a little produced. Fourth leg longest, not notably slenderer than the others.

puggettense

Carapace transversely oblong, or subpentagonal. Fourth leg not longest, but notably slenderer than the others.

politus

Dactyli of legs subequal.

Carapace thin, soft. Dactyli of legs falcate.

Carapace considerably less than half again as wide as long.

5. Fourth leg strikingly narrower, feebler than the others. Propodus with subparallel margins. Legs thinly set on margins. *serratum*

6. Fourth leg narrower than the others, but not strikingly so. Propodus strongly narrowed distally.

7. A large pit either side of middle. Posterior

acetylus of outer maxilliped either oblong or subspatulate, two-thirds as long as propodus.

Carapace wider than long.

δ^1 . Carapace suborbicular, pubescent; front a little produced _____

δ^2 . Carapace nearly square, with rounded corners, naked _____

Carapace as long as, or longer than, wide.

δ^1 . Dactylus of fourth leg much longer than that of the others _____

δ^2 . Dactyll of legs similar, falcate _____

Dactylus of outer maxilliped spatulate, two-thirds as long as propodus.

Hands short, bare. Carapace nearly one and a half times as long as wide _____

Hands elongate, strongly ciliated on lower margin _____

Males not known _____ *bipunctatus*, p. 78; *depressus*, p. 80; *mullinarum*, p. 81.

KEY TO MALES OF AMERICAN SPECIES OF THE GENUS PINNARIA

pace wider than long.
 tactyl of last leg unlike the other three, being long and
 of short and curved-----
 tactyl of last leg not very unlike the other three.
 Carapace octagonal. Sternum sharply cristate-----
 Carapace suborbicular. Sternum not sharply cristate
 D¹. Anterior half of carapace thickly margined with
 margin transverse, rimmed.
 E¹. Carapace convex. Propodus of fourth leg not re-
 Eyes moderate-----
 E². Carapace flat. Propodus of fourth leg broadly

nen transversely oblong.....	<i>orcuttii</i>
wollen in middle, not much if any wider at distal en- e.	
e deeply areolated. Manus longitudinally ridged. Te- nt of abdomen subrectangular with rounded tip.	<i>shoemakeri</i>
e moderately areolated. Manus scarcely ridged. Te- nt of abdomen equilaterally triangular, blunt-pointed	<i>taylori</i>
region gradually inclined downward toward margin.	
4 large, persistent, white spots.....	<i>maculatum</i>
vt.....	<i>holmesi</i>
69; <i>politus</i> , p. 71; <i>angelicus</i> , p. 72; <i>lithodomi</i> , p. 73; ; <i>nudus</i> , p. 83; <i>pubescens</i> , p. 87; <i>strombi</i> , p. 90; <i>sil- latus</i> , p. 93; <i>moseri</i> , p. 94; <i>guerini</i> , p. 101; <i>hirtimanus</i> ,	

MALES AND FEMALES OF THE AMERICAN SPECIES OF PINNOTIA.

EAST COAST SPECIES.

-----Salem, Massachusetts, to Micco, Flor- ida; Guadeloupe.....	♂
-----Vera Cruz; Cuba; Porto Rico.....	
-----Cape Cod to Texas; Jamaica; St. Thomas.....	♂
-----New Jersey to Cuba.....	♂
-----Cuba; Jamaica; Porto Rico.....	♂
-----St. Thomas; Guadeloupe.....	♂
-----West Florida.....	
-----West Florida; Jamaica.....	
species.....West Florida; St. Thomas.....	♂
pecies.....West Florida.....	♂

ta Smith—La Paz; Panama
us, new species—Gulf of California
new species—British Columbia
new species—Manzanillo

ogous species of *Pinnotheres* on opposite sides of the Atlantic—*ostreum* (Atlantic); *holmesi* (Pacific).

PINNOTHERES OSTREUM SAY.

OYSTER CRAB.

Plate 15, figs. 3-6.

Innotheres pinnophylax Bosc, Hist. Nat. Crust., vol. 1, pt. 2, p. 243 (part), not pl. 6, fig. 3 (after Herbst) nor *Cancer* Herbst, 1783; coasts of America in *Chama lazarus* (Bosc). As this is a European species of *Chama*, Gmelin is doubtless the species indicated.

Innotheres ostreum SAY, Journ. Acad. Nat. Sci. Philadelphia, 1818, p. 67, pl. 4, fig. 5, female (type-locality, Inhabits the oysters of the Bay of Fundy, type not extant).—DE KAY, Nat. Hist. New York, pt. 1, p. 12, pl. 7, fig. 16, female.—SMITH, Rept. U. S. Commission of Fish and Fisheries, pt. 1, for 1871-72 (1873), p. 546 [252]; not *Innotheres crassipes* DESBONNE, in Desbonne and Schrader, Voyage à la Guadeloupe, pt. 1, 1867, p. 43 (type-locality, Guadeloupe, *Crassipes*; type probably not extant).

agnosis.—First leg of female stoutest, propodus of the acetylus curved, other legs similar to one another and straighter than in first leg. Carapace thin. Pecten wide distal end. Propodi of all legs in male

podus, as well as upper, convex, fingers, esp. one, stout, not gaping, tips hooked past each tooth on prehensile edges; fixed finger horizontal, subcylindrical, last 2 joints with thin fringe of setae, propodus widening distally, dactylus about 1½ times as long as broad; last 3 legs similar to one another, dactyli of second leg longer than those of first and fourth.

Abdomen very large, extending beyond carapace in all

stages of male.—Relatively smaller and less swollen, front more advanced. Chelipeds similar to female but palm shorter, more swollen. First leg longer than others, palm wider than for the dactylus which is longer, two-thirds as long as in female, not so curved as in female; in the remaining legs it is wide as in the first leg, not slender as in female. Legs are longer than in female, the fourth one quite as long as the fifth; they are nearly straight proximally but becoming slightly sinuate distally. Sides of abdomen nearly straight and parallel from the third to the seventh segment, which is arcuate. Translucent whitish generally. Upper

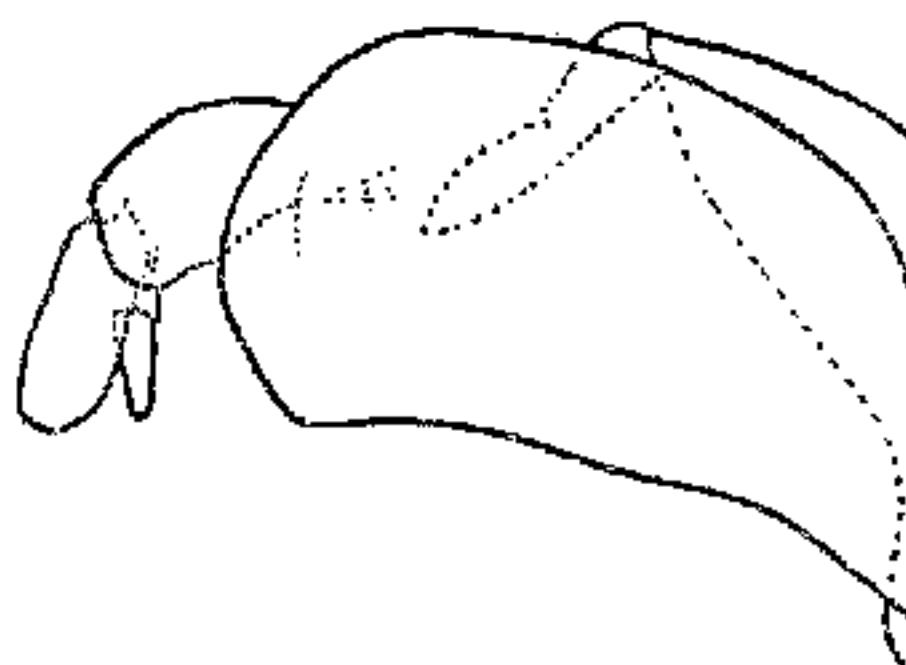


FIG. 30.—*PINNOTHERES OSTREUM*
MAXILLIPED OF FEMALE (2542).

ge.—Salem, Massachusetts, to Micco, Florida
onne).

Serial examined.—

York Bay; from oysters; E. G. Blackford; 74
York market; from oysters; E. G. Blackfo

t coast of Chesapeake Bay, Northumberland
December 23, 1914; P. L. Boone; 4 females (49
pahannock River, Virginia; in oysters; A. C. W.
C.).

of Lynn Haven oysters, Virginia; November 2
series; 2 females (49210).

ufort, North Carolina; Union College Coll.;
in U.S.N.M. (49209).

yah Bay, South Carolina: December, 1891;
Fish Hawk; 5 females (18214). December 3;
Steamer Fish Hawk; 6 females (18215). One-hal

on South Island; dredged; Sh.; temp. 49.5°
stations 1641, 1642; steamer *Fish Hawk*; 1 female
n Bank Creek, South Carolina; from oysters;
Steamer Fish Hawk; 3 females (18216).

rleston, South Carolina; from a starfish; L
e, 3 mm. long, mature (5730, M.C.Z.).

eton River, South Carolina; 1891; steamer
es (26108).

t peninsula opposite Micco, Florida; O. Ba

suggests that in *Fabia*. Front between orbits faintly emarginate, orbits partly visible from above; outer maxilliped suboblong; propodus no longer narrower, end obliquely rounded; dactylus linear throughout, rounded at extremity, inserted half way from base of propodus and not reaching its distal end. Larger than legs, but not very large; lower margin straight, palmar porosities extending rapidly to a point before fingers; fingers stout, curved, prehensile edges unbroken; tooth near base of

length of legs represented by second longest; 2, 3, slender; dactyl 2 much longer than 3 or 4 and curved on anterior side, dactyl 3 less curved on anterior and nearly straight, dactyl 4 a trifle longer than 3, margins of tips of all four very slender and hooked. Finger not reaching middle of propodus, widest distal to the middle and narrowest at tip, dactyl shortest of all, conical except for tip. Carapace luminous, much longer and wider than carapace. Dimensions.—Female holotype, length of carapace 7.2, width

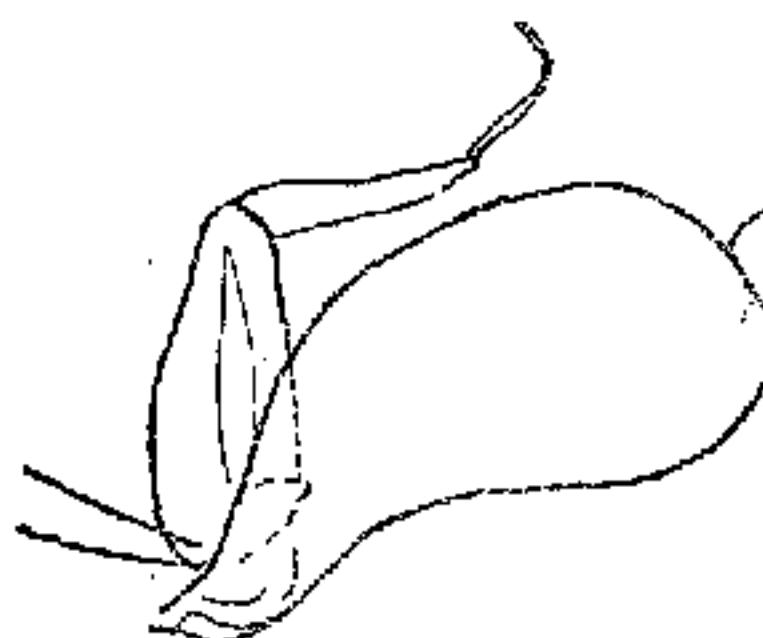


FIG. 31.—PINNOTHERES
OUTER MAXILLIPED OF
HOLOTYPE, $\times 15\frac{1}{2}$.

agnosis.—Near *ostreum*. Propodus of first leg
y same width throughout. Palm widest at distal end,
very thin.

Description of female.—Carapace very thin and
slightly suborbicular, broad behind. Gastric region
separated by a furrow, cardiac region less distinct.
Posterior margin slightly projecting, truncate in dorsal view;
eyes partly visible in dorsal view.

Crus of outer maxillipeds robust, outer margin rounded;
margin with bluntly rounded angle near distal end;
propodus robust, the latter rounded and smooth; dactyl
very slender, styliform, reaching about half way to
propodus.

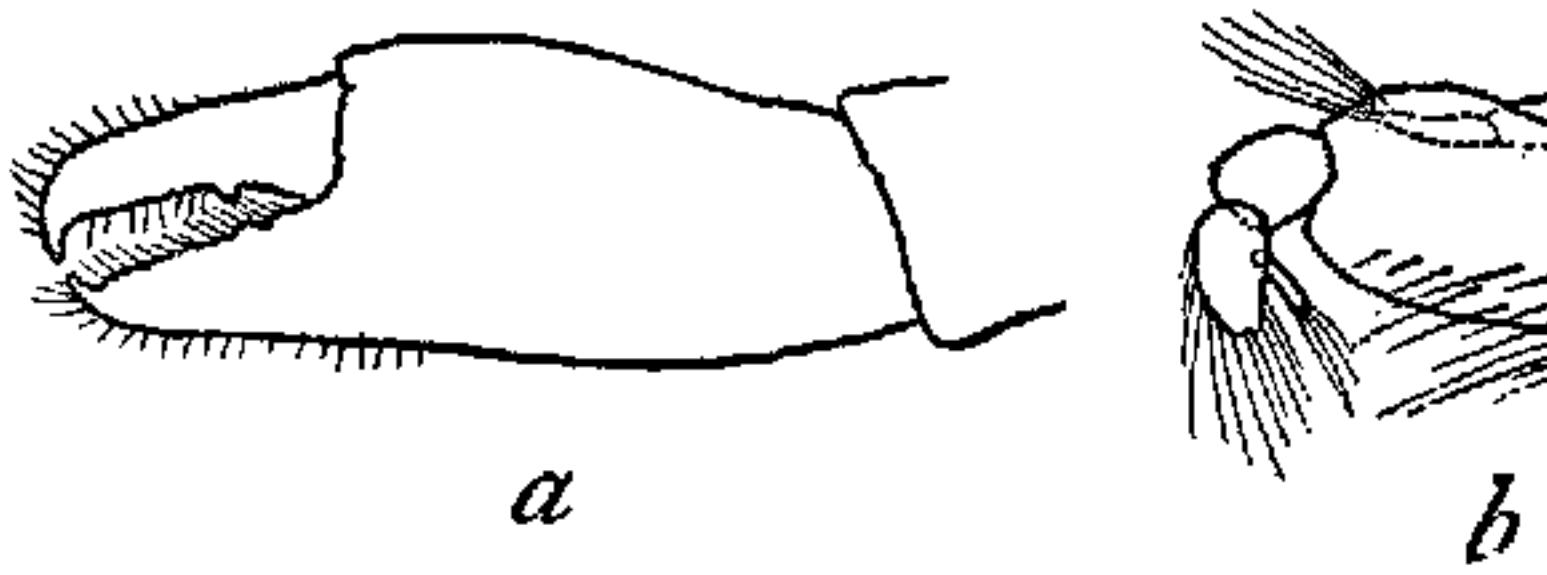


FIG. 32.—*PINNOTHERES GEDDESI*, FEMALE (23767). *a*, CARAPACE; *b*, OUTER MAXILLIPED, $\times 16$.

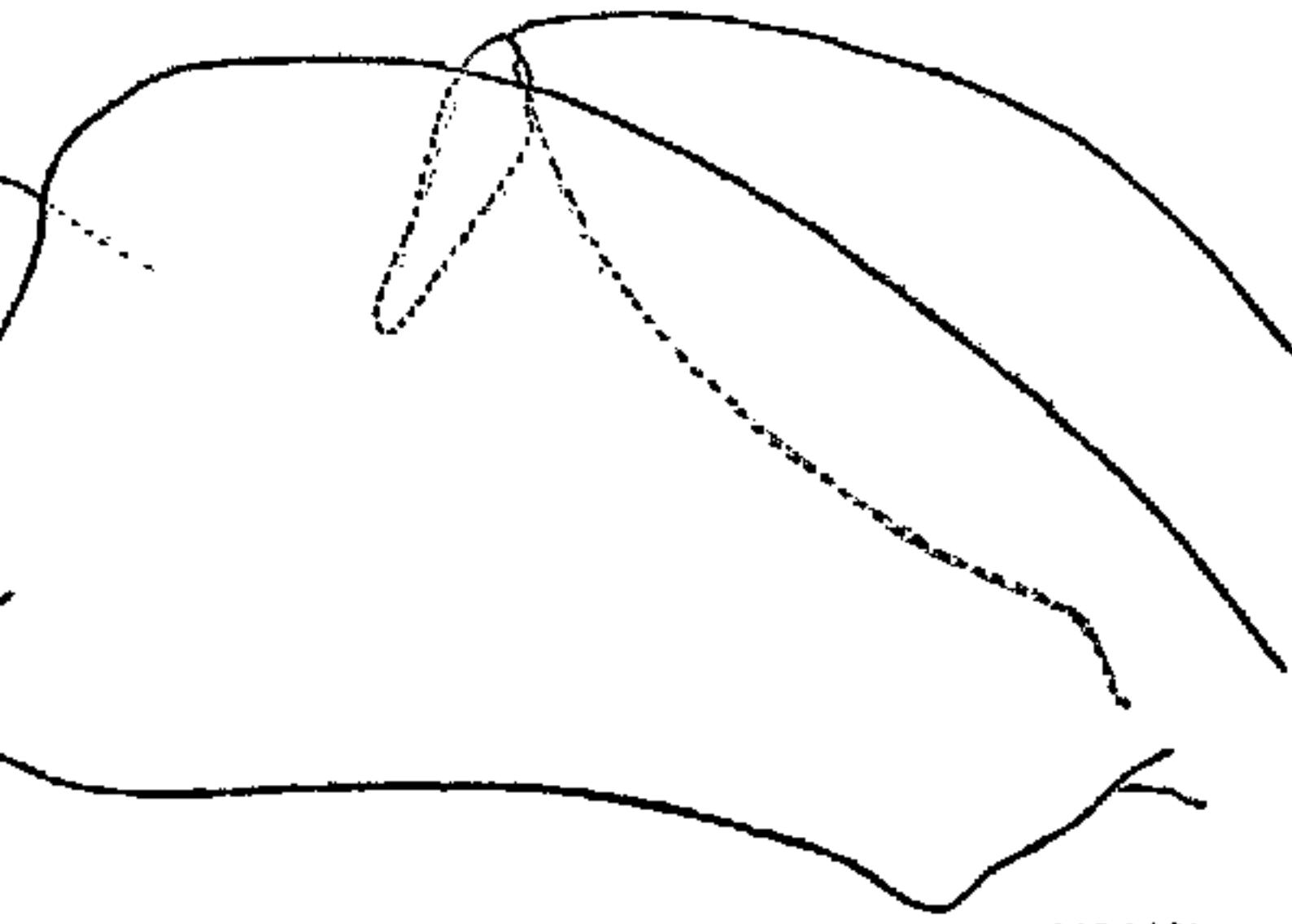
Maxillipeds smooth; palm rapidly increasing in width, ending in a hook near distal end, which articulates very obliquely; upper margin convex at widest part, lower margin

tojo, Mayaguez, Porto Rico; in oysters; Jan. 24
Hawk; 2 females (1 ovig. is holotype of *ostr*

PINNOTHERES POLITUS (Smith).

Plate 159, fig. 5.

politus SMITH, Trans. Connecticut Acad. Arts and Sci.
169 (type-locality, Callao, Peru; type in Peabody M.
-LENZ, Zool. Jahrb., Suppl., vol. 5, 1902, p. 765, pl. 23;
TER, Revista Chilena Hist. Nat., vol. 13, 1909, p. 249.
c. U. S. Nat. Mus., vol. 38, 1910, p. 545, text-fig. 3 (afte



PINNOTHERES POLITUS, OUTER MAXILLIPED OF FEMALE (40448). X

Carapace wide, thin, flat. Last leg very slender.
Palpus. Propodus of second and third legs distal

nded; last leg shorter than third, and slender
tulus slightly curved and very long and slender, ex-
odus.

domen very wide, exceeding sternum.

Measurements.—Female (40448), length of carapace
8 mm.

Habitat.—In shells of mollusks: probably *Mytilus*
(Th.), *Calyptrea*, species (Lenz), *Crepidula dilata*
nge.—Peru; Chile.

Material examined.—

Con Bay, Peru; found with *Crepidula dilata*
els; R. E. Coker, coll.; received from Peruvian
male ovig. (40448).

Alcahuano, Chile; Hassler Exped.; received from
; 1 female (22848).

PINNOTHERES ANGELICUS Lockington.

Plate 16, figs. 5 and 6.

Pinnotheres angelica Lockington, Proc. California Acad.
1876 (1877), p. 155 [10] (type-locality, Angeles
fornia, in oysters; types not extant). Not *P. angeli*
Linn. Soc. London, Zool., vol. 15, 1880, p. 86.

agnosis.—Female transverse, smooth, shining.
leg much the longest. Prominent tubercle on l

tennae. D
gnath atta



usually large.

s.—Female (17467), length of carapace 9, wi

oysters (Lockington) and mussels.

f of California at Angeles Bay (type-locality);
nd.

mined.—

island, Gulf of California, Mexico; Mar. 16, 1907
(17467).

, Gulf of California; in *Modiola copax*; 4 fem
Cal.).

PINNOTHERES LITHODOMI Smith.

Lithodomi SMITH, Trans. Connecticut Acad. Arts and Sci., 1870, p. 169 (type-locality, Pearl Islands, Bay of Panama); *Merus aristatus* Forbes and Hanley; type in Peabody Mus. (1870).

Merus of maxillipeds broadest at distal extremity, straight. Legs very slender; dactyli slightly curved; second next, first and fourth subequal.

of female.—Dorsal surface of carapace smooth. Merus of outer maxillipeds broadest at distal extremity, straight. Chelipeds equal, smooth and naked; fingers short, nearly straight, tips slightly hooked; cheliferous edge of dactylus armed, near base, with

innotheres maculatum SAT, Journ. Acad. Nat. Sci. Philad., 1818, p. 450 (type-locality, "inhabits the murice coast"; cotypes, male and female, in British Mus.).
innotheres maculatus VERRILL, Rept. U. S. Commr. of Fish and Fisheries, vol. 1, 1871-1872 (1873), pp. 309 [15], 434 [140], Rept. U. S. Commr. of Fish and Fisheries, vol. 1, p. 546 [252].—FAXON, Bull. Mus. Comp. Zool., v. 52, footnote (Zoea).—FOWLER, Ann. Rept. New Jersey State Geol. and Nat. Hist. Surv., 1912, p. 435, pls. 136 and 137; not (?) *P. byssorum* Gibbes.

Innotheres ostreum SMITH. Rept. U. S. Commr. of Fish, vol. 1, 1871-1872 (1873), p. 546 [252], part: pt. 1, *P. ostreum* Say.

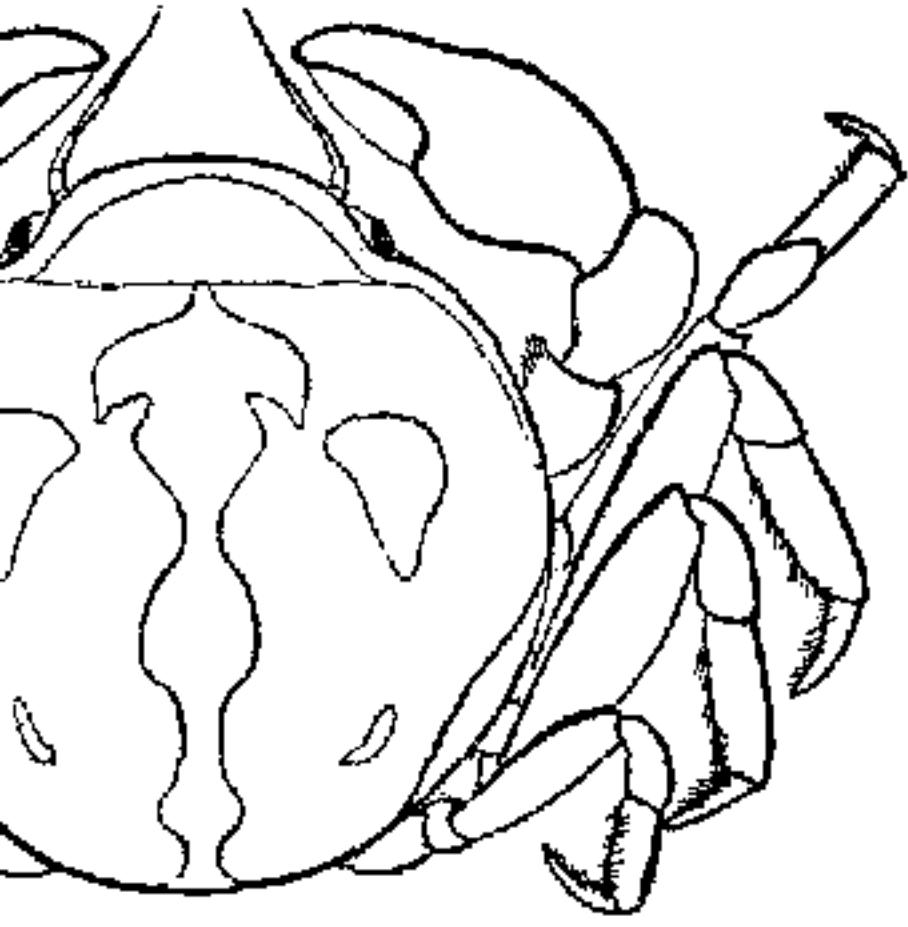
agnosis.—Dactyli of first 3 legs hooked, ought. Males usually, and the young always . Female with shell thick, not yielding.

Description of adult female.—Surface covered with silvery tomentum. Carapace subcircular, little broader than long, thin, smooth, and firm but not hard, convex, uneven, smooth, median area higher and separated by depressions from lateral area; antero-lateral angles a little prominent, about one-fifth width of carapace, in front acute, bilobed by a shallow sinus, edge bent back, angular lobe in front view. Orbita small, subtriangular. Antennae as long as width of orbit. Anteriorly transverse.

opodus of outer maxilliped larger than carpus

ce of which is overlaid with a thin fringe on upper margin; last leg relatively shorter than middle of propodus of third; dactylus broader than in female.

its middle about one-third width of sternum, long from third to seventh segment, sides of third o-



PINNOTHERES MACULATUS, MALE, \times 8.
(AFTER SMITH.)

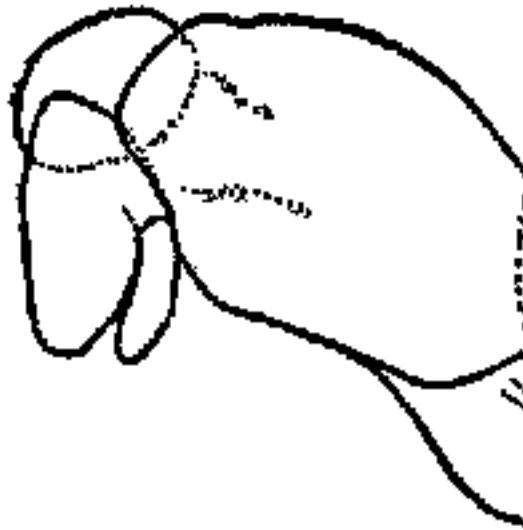


FIG. 36.—PINNOTHERES
MACULATUS, OUTLINES
ILLIPED OF MALE
(36782), \times 10.

y rounded. Sutures between segments of abdomen marked with a narrow line of dark pubescence. Young females resemble the male except in the shape and the character of its appendages; they have pubescence and long hair on the legs, all male characters; female-looking females are free-swimming like the males.

me 14.3 mm. Male (18014), length of carapace 8.1 mm.

range.—Cape Cod to Texas; Cuba; Jamaica; St. Lucia; to 21 fathoms.

terial examined.—

Marthas Vineyard, Massachusetts; Katama
iles; 5 fathoms; S.; temp. 62° F.; Sept. 6, 1883.
Fish Hawk; 1 female (36900).

oods Hole, Massachusetts; U. S. Fish Comm.:
s; 1 y. (4082). Surface; Oct. 21, 1881; V.
s and females y. (15022). Aug. 9, 1882; 1 male
882; 1 female y. (40804). Sept. 15, 1882; 1 m.
06). Surface; Sept. 17, 1882, evening; 1 male
Oct. 2, 1882, 8 p. m.; 1 female y. (12560). Su-
; Aug. 5, 1885; 24 males and females y. (1091
ric light; August, 1885; steamer *Albatross*; 1 m.
1184). 1885; 1 female ovig. (34919). From
26, 1886; 1 y. (11840). Mar. 28, 1888; V. N. E.

er, Massachusetts; from scallop; October 9, males (of 2 sorts), 11 females (18014).

Rhode Island: Surface; July 30, 1880, even.; 3 males, 4 females y. (34082). Near Fort Adams; surface; August 22, 1880; U. S. Fish Comm.; 17 fms.; 17½ fathoms; S. Scallops; temp. 54° F.; A. 789; steamer *Fish Hawk*; 2 males, 1 female y. (Judith W. ½ S., 4½ miles; in *Modiola modioloides*. brk. Sh.; temp. 53.5° F.; August 12, 1880; steamer *Fish Hawk*; 1 female ovig. (36741). August 24, m.; 1 female ovig. (36786).

Bay, Rhode Island: Beaver Tail Light, S. by E.; S. Sh.; temp. 67° F.; August 6, 1880; station 776; 1 female (34018). North End Dutch Island; 16–27½ fathoms; G. S. M.; temp. 68° F.; August 6, 1880; steamer *Fish Hawk*; 3 males, 3 females (1 y.) (36307). Station 781; 16–27½ fathoms; S. Sh. brk. Sh. Gr.; August 7, 1880; stations 776–781; steamer *Fish Hawk*; 1 female ovig., 1 y.) (36782, 40803). Off Brentons Reef; 16–27½ fathoms; S. brk. Sh.; temp. 63°–66° F.; August 23, 1880; steamer *Fish Hawk*; 1 female y. (40802).

Land, Rhode Island: In *Modiola*; September, 1880; 1 female ovig. (36889). August 12, 1874.

ms; hrd.; temp. 50.3° F.; Apr. 22, 1916; sta-
t; 1 male, 1 female, both young (49644).

Beaufort, North Carolina: In tube of *Chaetopterus*
u of Fisheries; 1 male (Beaufort Lab.). 1
z; zoeae hatched the night of August 9, 1908
es and zoeae (42850). Exploration of the
d States; 1 female (2472).

Cape Fear, North Carolina; from *Modiola tulip-*
brk. Co.; October 20, 1885; steamer *Albatross*
3).

antic Ocean, 16 miles off Sapelo Island Light-
s, 1915; station 8259; *Fish Hawk* (Danglade);
Marco, Florida; from *Pinna muricata*; May, 1884;
. female ovig. (6971).

ndeleur Islands, Louisiana; L. R. Cary; 2 fe-
tagorda Bay, Texas; J. D. Mitchell; 1 female
pa, at Cabañas; 2-25 fathoms; taken by sub-
shell, grass to mud bottom; June 8-9, 1914; sta-
nd Bartsch, *Tomas Barrera* Exped.; 2 males (4
naica, West Indies; March 1-11, 1884; steam-
. 19 females (18 ovig.) (18015).

gston, Jamaica; taken by electric light; 1884;
er *Albatross*; 48 males and females y. (7737).

Thomas, West Indies; January 17-24, 1884; ste-
ales ovig. (7666).

in *Psetta Edmundsi*; 1 male (20950).

coarse hair, scarcely visible; dactyls strong, curved.

Tarsus, elongate; terminal segment triangular, long. Posterior part of body rough with spinules; there are some small ones on the inner margin of

abdomen yellow.

—Length of male carapace, 1 to 2 lines (Nicolet 2a cited, 3.5 mm.

Foundably in sea-urchins (Nicolet).

Carlos de Chiloe, Chile.

PINNOTHERES DEPRESSUS Say.

Plate 17, figs. 1 and 2.

depressum SAY, Journ. Acad. Nat. Sci. Philadelphia, v. 1, p. 100, 1818 (type-locality, Egg Harbour; type not extant).—For description see New Jersey State Mus. for 1911 (1912), p. 433,

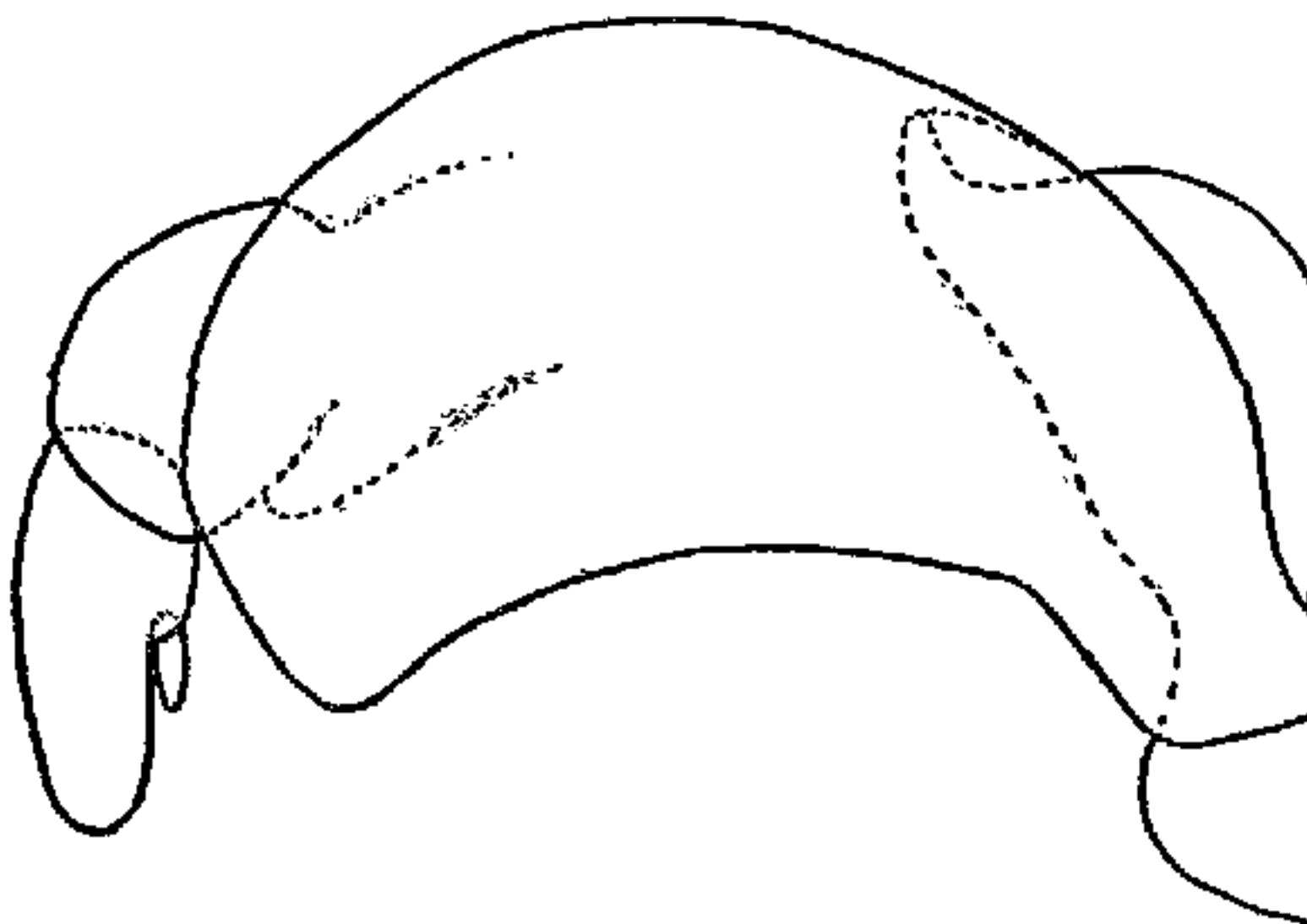
RATHBUN, Amer. Nat., vol. 34, 1900, p. 590.

Carapace of male flat, bordered by a rim of short hairs.

Chelipeds very stout. Legs similar, dactyli and propodus much expanded, oval.

male.—Carapace flat, suborbicular, with the front margin bending downward and the hind margin very

ngers are closed, the tips cross each other.
the ambulatory legs the second and third are
n, the first a little shorter, fourth shortest; pi

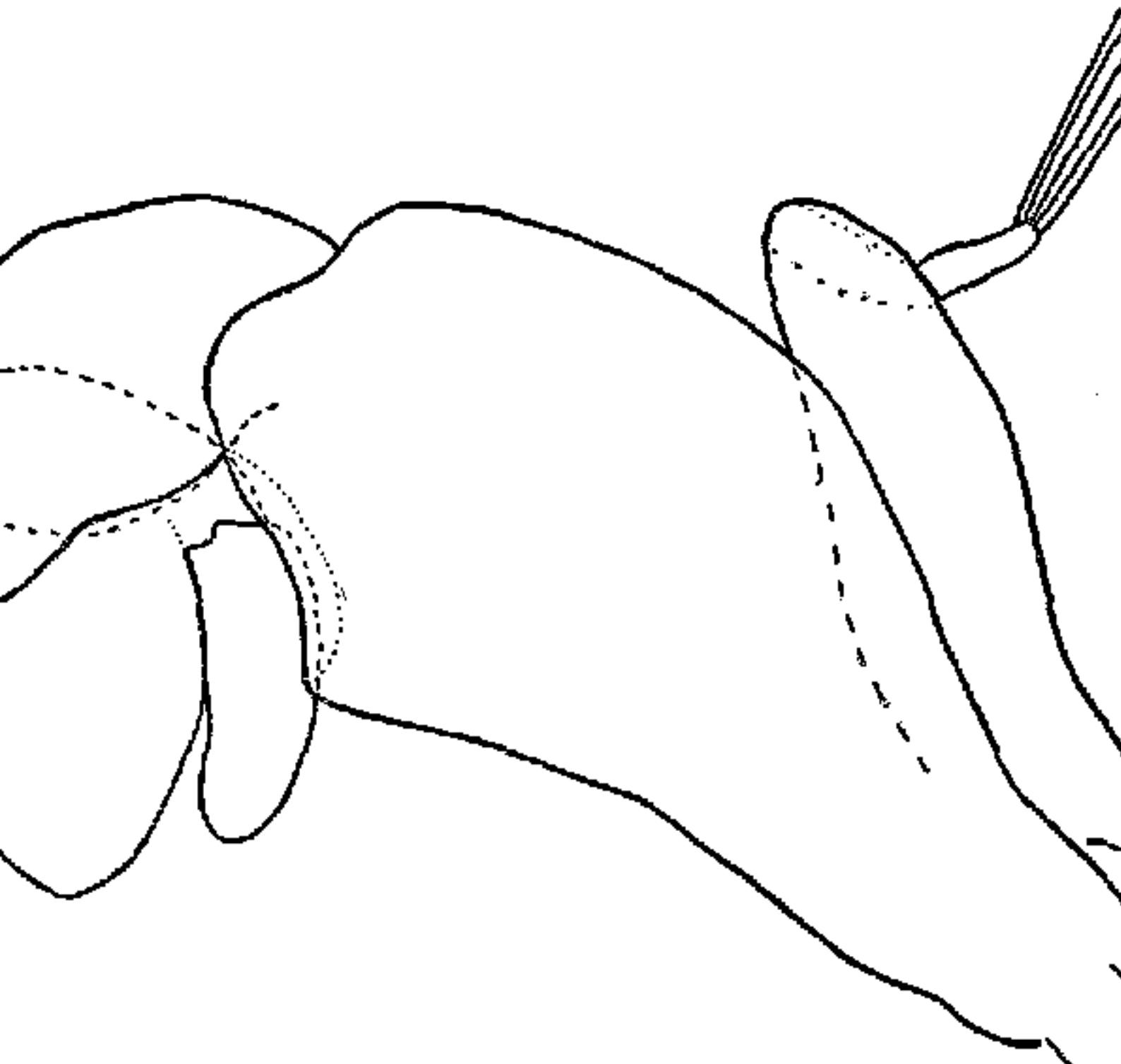


37.—*PINNOTHERES DEPRESSUS*, OUTER MAXILLIPED OF MALE
terior margin, faintly crenulate on posterior side,
hick, its posterior margin straight, of second and
arth convex, the fourth propodus being greatly
rm; dactyls similar, elongate, with long, slender
domen gradually narrowed, terminal joint no longer
ounded.

Measurements.—Male (48594), length of carapace

en from above.

Outer maxilliped of large size, short and very wide; trochanterus about as long as carpus, suboblong, ending



ANNOTHERES MULINIARUM, OUTER MAXILLIPED OF MALE HOLOTYPE

pectylus broad, lunate, attached near base of proctiger, curve, and reaches nearly to its extremity. Dorsal and lower surface of body pubescent. Manus

nthia; type in Mus. Univ. California).

sis.—Female, carapace subpentagonal, widest just immediately behind fingers. Legs increasing in size 4; dactylus of fourth pair much the longest.

tion.—Carapace soft and yielding, smooth, subtriangular, between antero-lateral angles. Front broadly produced, projecting little beyond general outline.

Orbits nearly circular, partly hidden from above.

Maxillipeds very oblique, the maxilla becoming bescient; merus of large size, pentagonal; last two segments of chela quadrate, distally oblique, the inner margin (inner, when folded) produced, dactylus small, attached distally to the end of propodus, the end of which does not reach the tip of the chela.

ENOTHERES PUGETTENSIS
GARNIER OF OUTER MAXILLIPEDS
OF FEMALE (40396).

Merus of chelipeds furrowed on upper margin; hands elongate, rounded, widest behind fingers; fingers and inner side of chela smooth; fingers subcylindrical, nearly straight, a little curved, tips strongly hooked; dactyl with a low toothed, serrate, or sinuate margin; immovable finger produced at the base of the dactylus.

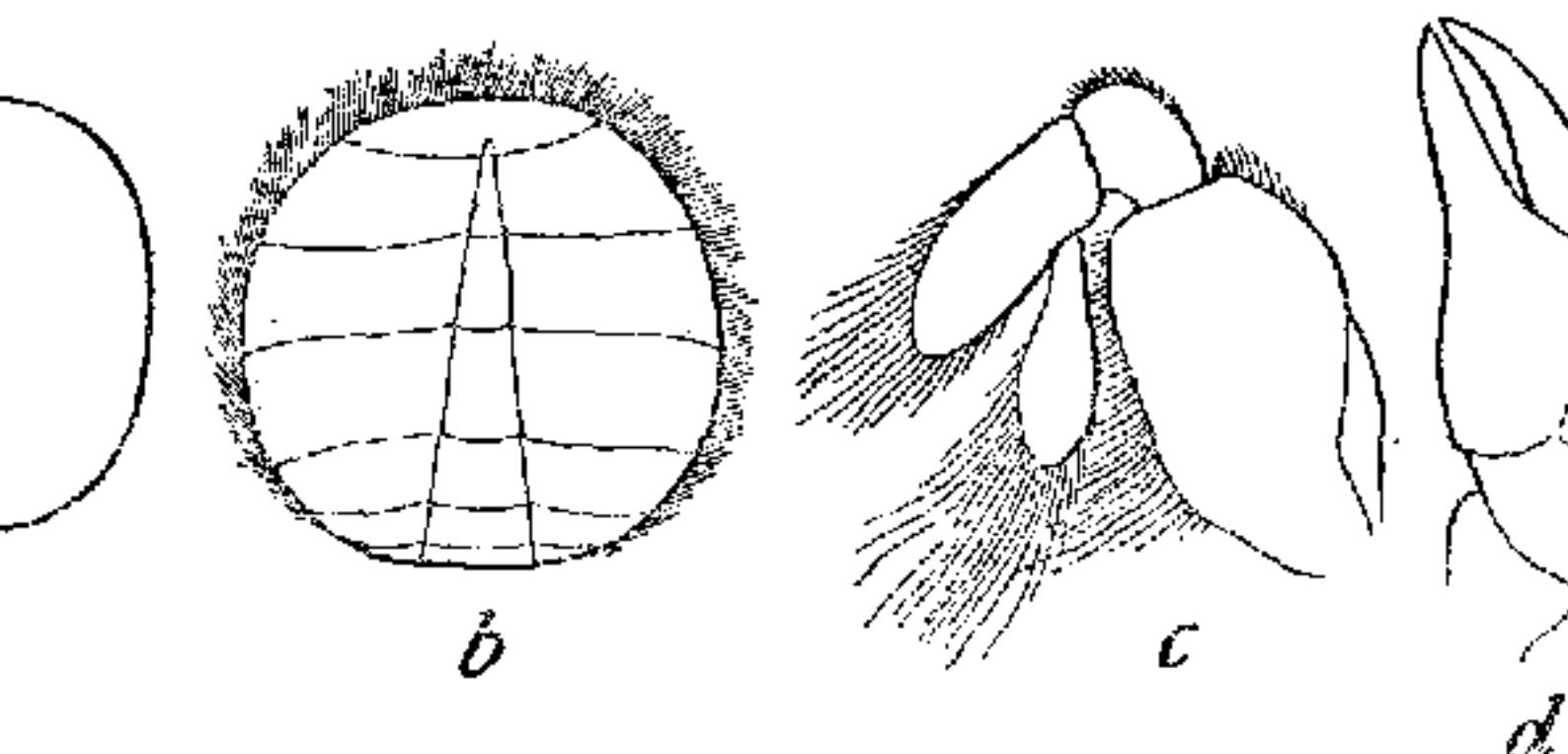
Legs slender, increasing slightly in length from first to fourth pair; dactylus narrow,

PINNOTHERES NUDUS Holmes.

res nudus HOLMES, Proc. California Acad. Sci., ser. 2, 3, pl. 20, figs. 1-5 (type-locality, Santa Cruz; type of Francisco fire); Occas. Papers California Acad. Sci., . Not *P. nudus* Weymouth, Leland Stanford Jr. U. Ser. No. 4, 1910, p. 53, text-fig. 1, except synonymy.

.—Carapace subquadrate with corners rounded; regions. Chela widest immediately behind legs nearly straight, longest and most slender

on.—Carapace a little broader than long, surfaces rounded, the anterior half nearly same shape



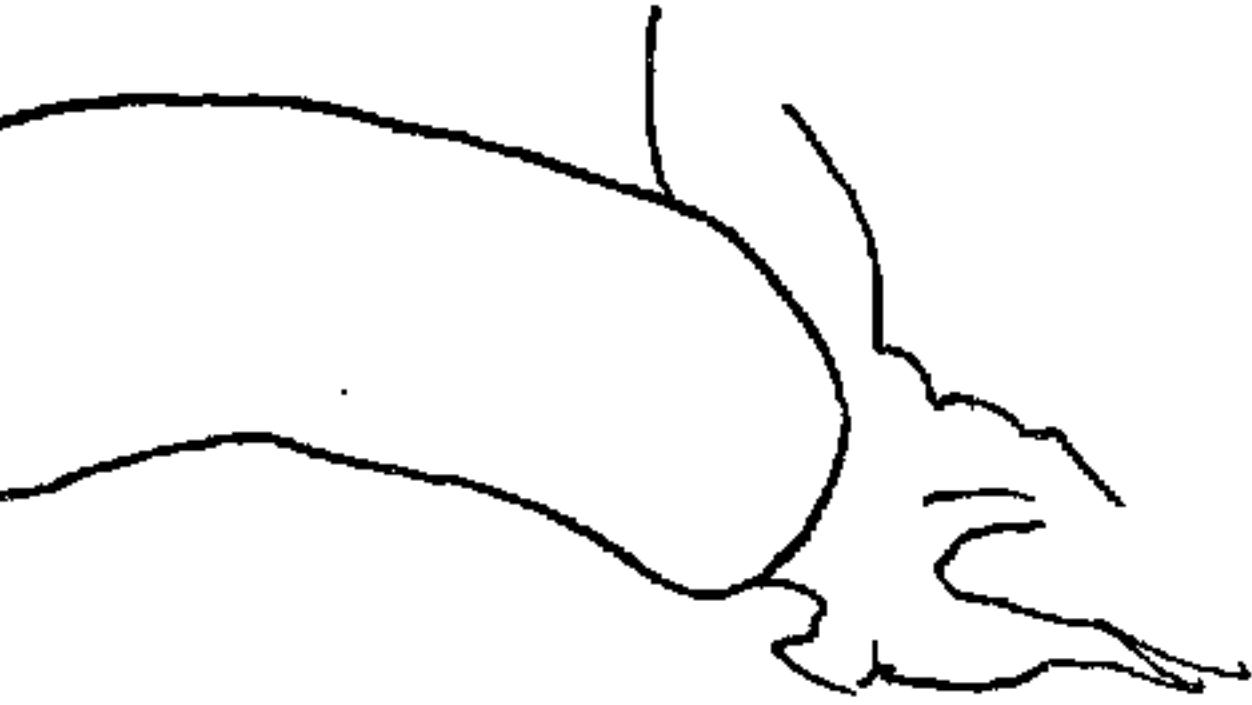
PINNOTHERES NUDUS, FEMALE HOLOTYPE. a, CARAPACE, SLIGHTLY OUT OF PLANE; b, OUTER MAXILLIPED; c, FIRST LEG. (AFTER HOLMES).

half; surface curving downward toward all

Plate 19, figs. 1-7.

Innoterres serrei RATHBUN, Bull. Mus. Hist. Nat., Paris, 1908, p. 116, pl. 19, fig. 1 (type-locality, Porto Rico; type in Paris Mus.).

agnosis.—Dactyli falcate. Palp of maxilliped I to end. Male spotted all over; sternum crisscrossed by dark lines. Carapace with two longitudinal rows of tubercles. *Description of male*.—Carapace slightly broader than widest in front of middle, posterior margin straight, arcuate; surface punctate, flattened but with a pit either side of cardiac region and a slight depression in center of cervical margin. Fins confluent. Anterior margin downward to nular plate nearly one-third width of carapace.



INNOTERRES SERREI, OUTER MAXILLIPED OF FEMALE (48571), $\times 20$.

together slightly exceeds half width of carapace, diminishing from base to tip, visible from above, each project slightly beyond outer corners of front legs, transversely-obliquely placed.

Maxillipeds small, occupying but little space.

second legs, cristiform.
n of female (48571).—Carapace much wider at corners rounded, front and orbits wholly in anterior margin as seen from above bilobed by median depression; on anterior half of carapace in middle, four of which form a square, oblique a little outside the outermost pit of the square than eyes.
weaker than in male, propodus sinuous below eight throughout, thumb slightly deflexed. Legs fringed with long hair on upper margin, tibiae on inner surface of carpus of first pair.
stout than in male, dactyli similar.
—A smaller female from Montego Bay has eyes, but not the orbits, visible in dorsal view. Virgin is not bilobed by median depression. Little anteriorly, legs slightly wider.
entire surface of male above and below cov. faint spots arranged with tolerable symmetry on spots on anterior surface of eye-stalks.
ents.—Male holotype, length of carapace 3, m.; female (48571), length of carapace 8.7, width

—Female commensal in *Strombus*, male free-sw.

Cuba: Jamaica: Porto Rico.

opsis.—Carapace almost hard, posterior margin half of carapace, as well as chelipeds and 1 with hair. Dactyli of legs falcate, similar.

otion.—Carapace subpentagonal, a little wider, smooth, a faint sulcus behind gastric and antero-lateral margins defined by a rim of and longest at antero-lateral angles; sides roundward; posterior margin transverse, rimmed; fur advanced. Eyes stout, in circular tennae equal in length to half width.

Terminal joint of palp of maxilliped attached to inner edge of propodus; when the maxillipeds are in place, it is bent on the thin edge of the merus.

Chelipeds stout, margined with coarse setae, as are also the ambulacra. Inner surface of palm swollen, much to distal end, lower margin convex.

of legs 2, 3, 1, 4, the second leg longest; segments of anterior margin of propodi and posterior margin convex; posterior margin of second propodus concave straight; dactyli similar, falcate, slender, hook slender, making nearly half length of segment. Abdomen and abdomen smooth, the latter bordered with hairs. In adult male and immature female tapering rather rapidly to last segment, third, fourth and fifth pa-

PINNOTHERES
M, E N D O -
OUTER MAX-
OF MALE
X 20.

swimming.

British Columbia to San Diego Bay, California.

xamined.—

Bay, Vancouver Island, British Columbia; May 20, 1916; C. McLean Fraser; 1 female (4962).

Bay, Vancouver Island, British Columbia; 17
; George W. Taylor; 1 male (39129).

nd; in animals of *Cardita borealis* Conrad; 2 s
ng female (17502).

, Washington; surface; *Albatross*; 1 female (Point, California; in bivalve, *Kellia laperousii* L.; W. F. Thompson; 1 male (Stanford Univ.).

ove, California; from mantle cavity of *Mytilus* (own; 1 male (23929).

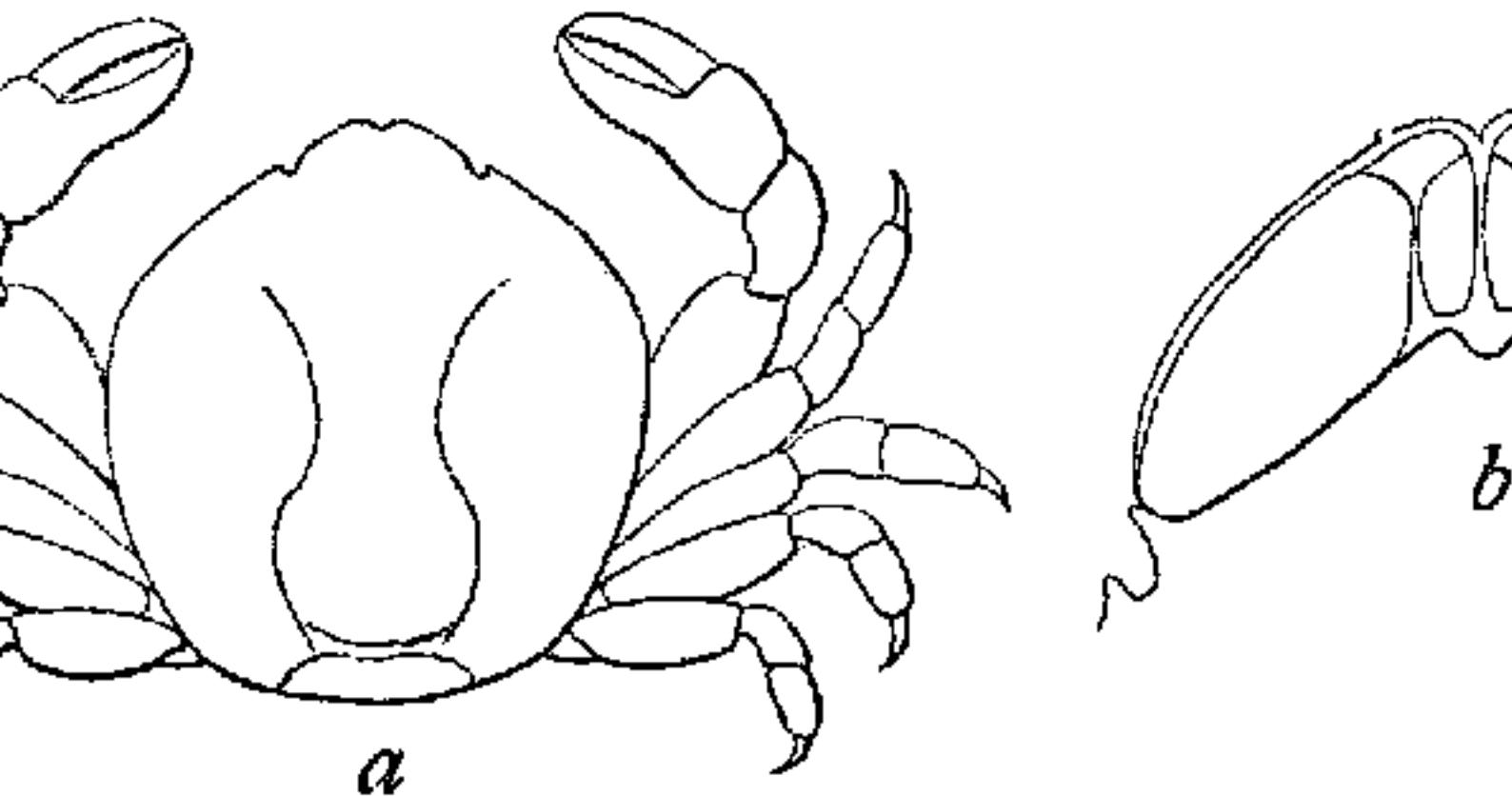
Cruz Island, California; lat. 34° N.; long. 119° W.; P.; Feb. 6, 1889; station 2945, *Albatross*; in *Phallusia vermiciformis* (45611). Identification.

San Diego County, California; in mantle of *Scyliorhinus*; 1882; C. R. Orcutt; 1 female holotype, 1 y.

Bay, California; Beacon No. 8, NW. by W.; 1883; fine. S. M. brk. Sh.; Mar. 19, 1894; station 25428; 2 males, 1 female (25428).

California; in *Donax levigatus*; C. R. Orcutt; 1883; 1 female (50443).

ubequal (last pair a little shorter than others) somewhat compressed, joints not unusually wide, slender, curved, and from one-half to two-thirds



ANNOTHERES PUBESCENS, FEMALE HOLOTYPE. *a*, GENERAL VIEW; *b*, BUCCAL AREA. (AFTER HOLMES.)

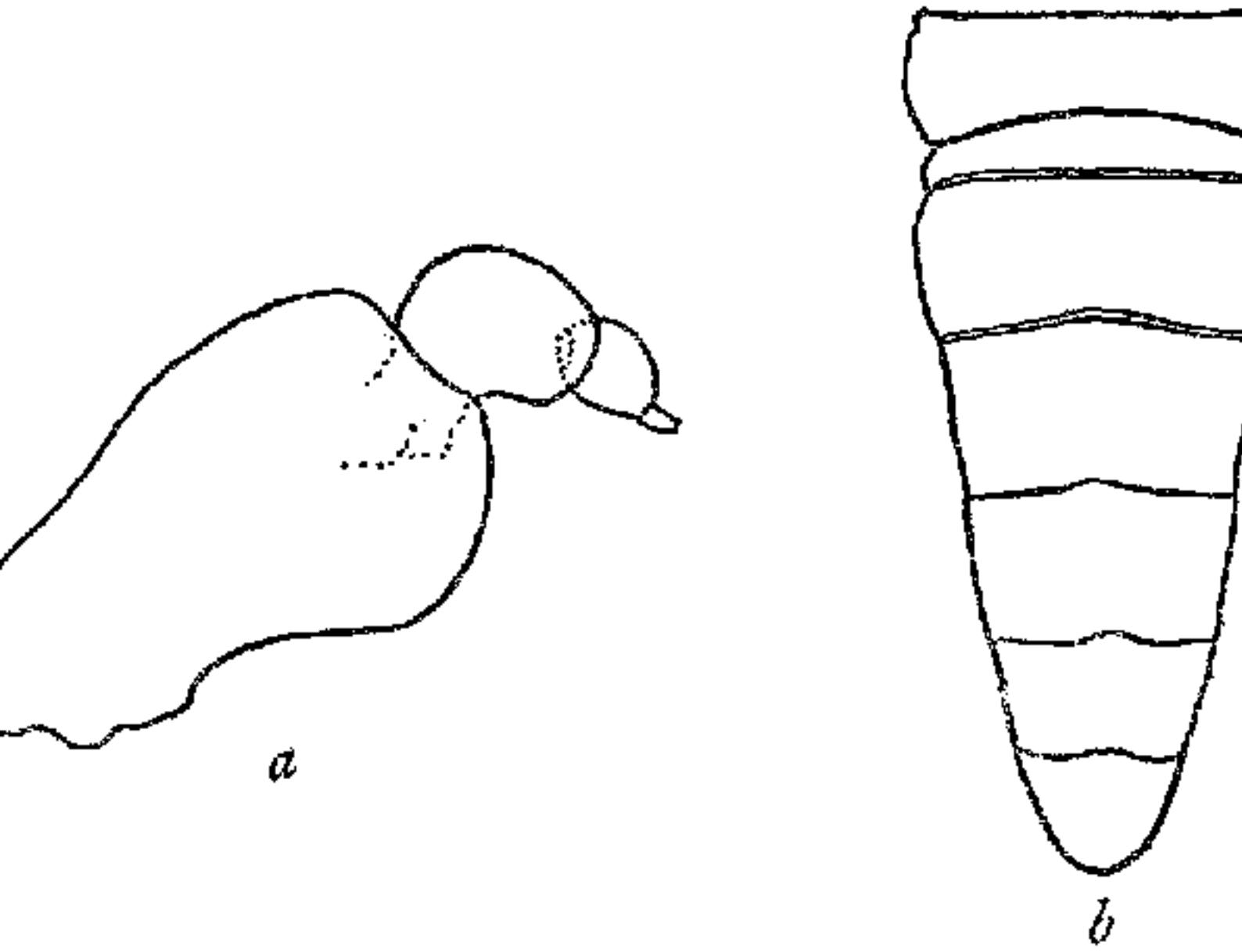
en rounded, slightly longer than broad, and convex. Body and legs covered with a uniform, fine pubescence. (After Holmes.)

Measurements.—Female holotype, length of carapace 10 mm. In Holmes's figure the carapace is slightly longer, perhaps due to flattening out the front in drawing.

Local recorded.—Muleje Bay, Gulf of California. Holotype (destroyed in San Francisco fire).

out twice as long as wide, attached at inner dis-

short, stout; propodus convex above, sinuous
conical, meeting when closed, a low tooth at r-
ge, tips hooked and crossing.



THERES BARBATUS (23435). *a*, ENDOGNATH OF OUTER MALE FEMALE, $\times 20$; *b*, ABDOMEN OF MALE, $\times 7\frac{1}{2}$.

ar, broad, compressed, dactyli falcate; first
than second, third reaching to middle of pro-
to middle of propodus of third.

of male.—Smaller and flatter than female an-

Plate 20, figs. 1 and 2.

heres strombi RATHBUN, Proc. Acad. Nat. Sci. Phil. 371, 2 text-figs. (type-locality, Clearwater Harbor; *strombus pugilis*; type in Mus. Phila. Acad. Sci.).

sis.—Carapace of female very wide, sides trun-
com above. Dactyli of legs falcate. Last leg mu-
three.

otion of female.—Carapace nearly one and a half
long, oblong, sides parallel, corners rounded; d^{own}
down toward margins, smooth and naked; inter-
easily wrinkled. Front less than one-fourth car-
pace, strongly deflexed, forming a sharp
angle at middle. Orbita suborbital, the upper
partly visible in dorsal view.

Outer maxillipeds with carpal joint large;
podal joints short and stout; cheliped small and almost terminal.

Chelipeds small, rounded; upper surface of propodus convex, lower margin of fingers slightly deflexed, stout,

tips sharp and crossing.

pair of legs a little the longest, first pair stout,
shorter and narrower than the others; dactyli with slender horny tips. Edge of front, anterior

of first three legs and lower margin of carpus



PINNOTHERES
ENDOGNATHUS OF
AXILLIPED OF FE-
MATE. MUCH EN-

toward the lateral and posterior margins where
nd smooth with a luster like porcelain. Frontal
an region, infero-posterior parts and margin
with a grayish tomentum. No furrows on the
slight and rather wide depressions near gastr
ressions at sides of cardiac region. Fronto-or
de; front vertically deflexed and produced at si
t in a very distinct acute lobe; between this
annular partition, the frontal border is deeply
rible from above, subcircular; ocular pedunc
cal. Antero-lateral margin rather long, separa
margin by a fairly well-marked angle, and
al margins by a more distinct angle; these
quely backward.

is slightly oblique and rather pilose; merus sub
cate at end; dactylus claw-shaped, exceeding
g segment.

rather large, subequal, calcified like the carap
smooth, inside thickly pilose; fingers somewhat
d incurved at tip, prehensile surface bearing lo

, stout, calcified, pilose along lower surface, alon
on outer face of merus; dactyls very short.

ents.—Female holotype, length of carapace 12,

rvical suture to hepatic region; branchial re-
long their inner side; front not protuberant,
slight median depression.

Chelipeds more longitudinal and of a firmer con-
cerus short and broad, inner margin angulate;
egment of palpus large, widest at middle when
nal segment, which is slightly spatulate and re-
propodus.

Legs very stout; hands long, nearly cylindrical;
ndrical, nearly straight almost to tips, which are
ner; dactylus with a small tooth near base which
propodal finger.

Stout; all ischial segments, as well as posterior
and dactylus of last leg, are clothed with a
ce; first 3 dactyli short, curved and pubescent in
second right leg, where propodus is consider-

leg of same pair, and dactylus very long, al-
d; fourth dactylus long, straight, slender and
or margin of sternum with a broad, rounded sin-
ips of palpi of maxillipeds. Abdomen orbicu-

-Smaller than female, less thickly pubescent,
l regions less protuberant, separated from gas-
pression; front slightly projecting, less defle-
Chelipeds and legs as in female, except that the

lifornia (Holmes); Pearl Islands, Bay of

PINNOTHERES RETICULATUS, new species.

Plate 21, figs. 1 and 2.

ity.—Gulf of California: off San Josef Island, Mexico; lat. $25^{\circ} 02' 15''$ N.; long. $110^{\circ} 43' 30''$ Sh.; March 17, 1889; station 3002, *Albatross*;

—Female suborbicular, longer than broad; hand leg longest, fourth dactylus longest, second swollen at base.

Carapace of female.—Carapace suborbicular, longer than broad, slightly convex; gastric region bluntly rounded, and separated by a deep suture from the branchial region; the two regions form a quadrilateral in dorsal view; a lunate depression on each side of the midline on the anterior margin. Front slightly produced, with a deep depression in the middle; in dorsal view, scarcely produced, with a deep depression in the middle; in lateral view, the curve of antero-lateral margin concave, and curve of postero-lateral margin convex. Eyes orbicular, large, visible; corneae of moderate size. Mouth parts well developed; articles of palpus of outer maxilliped short and thickened, and with subparallel margins and attachment points.

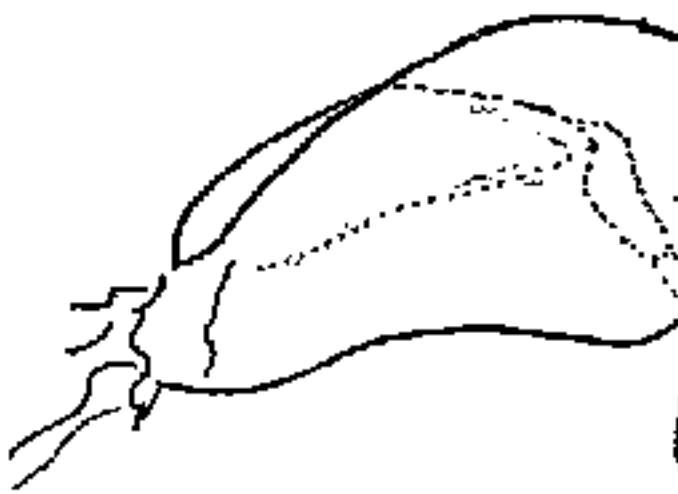


FIG. 46.—PINNOTHERES RETICULATUS, new species. OUTER MAXILLIPED OF FEMALE, TYPE, $\times 15\frac{1}{2}$.

region.

rementa.—Female holotype, length of carapace 2 mm.

ce.—Known only from the type-locality.

PINNOTHERES MOSERI,¹ new species.

Plate 21, figs. 3 and 4.

locality.—Port Royal, Jamaica; in black asphalt; female ovigerous (23440).

osis.—Carapace of female longer than broad, uneven. Legs slender, subequal.

Description of female.—Surface pubescent. Carapace firm but not hard, suborbicular with the front

region a little produced; surface uneven; gastric, cardiac, and intestinal regions elevated and well defined; a low tubercle on the side of the anterior margin; from a point on the posterior margin a blunt slightly (concave outward) ridge extending outward to the lateral angle or widest part of the ridge the surface descends steeply; the result the carapace appears subpentagonal. Front narrow, a slight margination.



PINNOTHERES MOSERI, ENDOSTOMA
OF OUTER MAXILLIPED OF FEMALE
L. M. S., X 17.

Commensal in black ascidian.
West coast of Florida; Jamaica.

examined.—

Curtins Reef, West Florida; lat. $28^{\circ} 43' N.$; long. $87^{\circ} 45' W.$ rocky bottom covered with grass and thin mud; 1887; Lieut. J. F. Moser, U. S. Navy; 1 female, "very many sea squirts in the dredge." Weston, Jamaica; 1891; T. H. Morgan; 1 female, "in black ascidian"; 1893; R. P. Bigelow, 1 is holotype (23440).

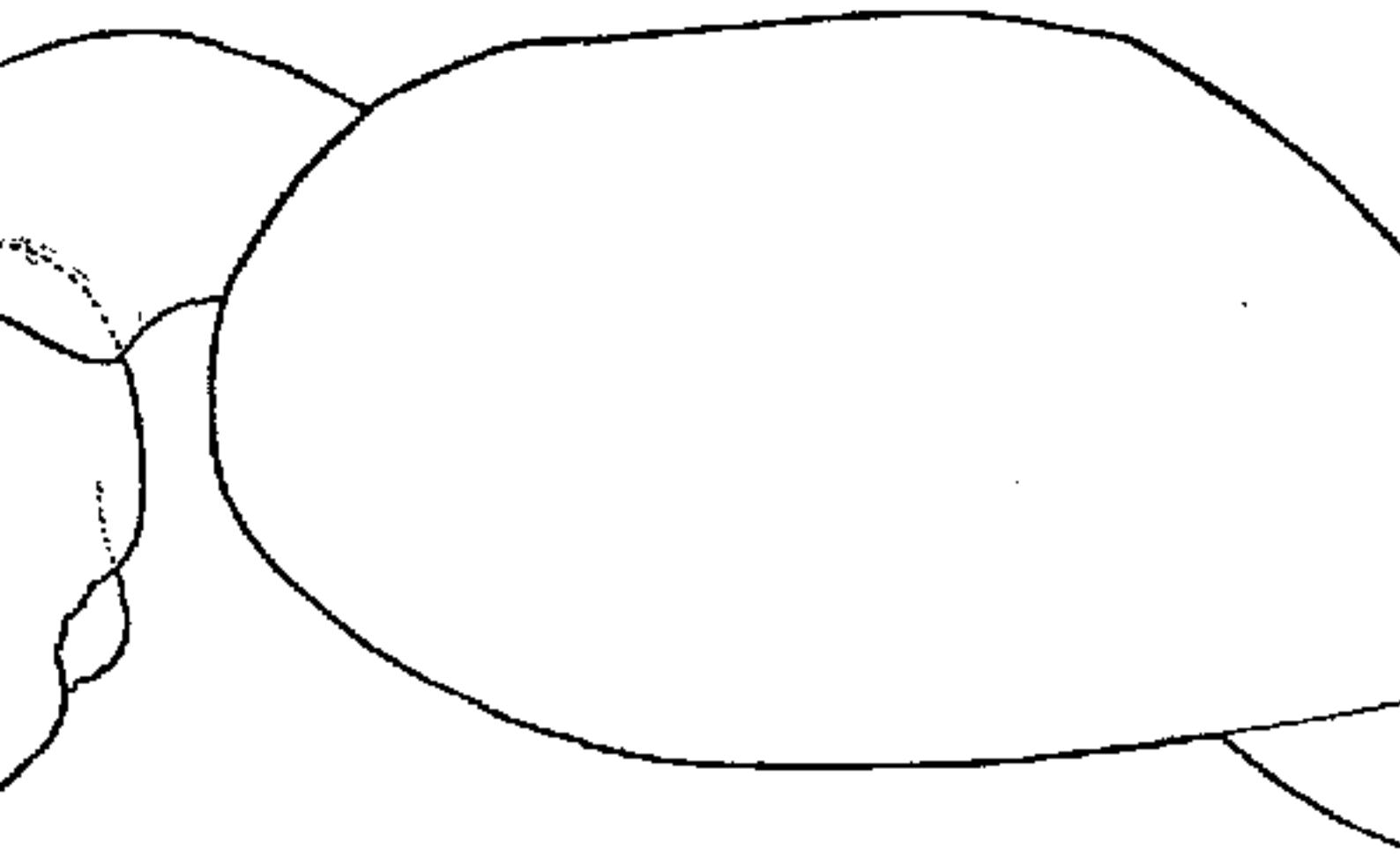
PINNOTHERES SHOEMAKERI, new species.

Plate 22, figs. 1-4.

ty.—St. Thomas; summer, 1915; Clarence I., from which the species is named; male holotype (492).—Male and female, a deep median groove on carapace, diminishing from 1 to 4; dactyli slender, curved, tips very uneven; manus very swollen, strongly rounded. *Female.*—Small species, pubescent all over; carapace, widest at middle; postero-lateral portion of back having a steeply inclined facet with smooth concave surface cut by deep furrows into high regularly placed ridges; one furrow surrounds the circular cardiac region; another, across middle of carapace; another, transverse, near

men narrow-triangular, second segment with
verse, median tubercle; terminal segment subre-
ctangular tip.

Description of female.—One damaged female showing
most shapeless carapace, a broad abdomen and



-PINNOTHERES SHOEMAKERI, ENDOGNATH OF OUTER MAXILLIPED,
TYPE, $\times 97$.

is referred to this species. A little larger than
its as in male. Surface short-pubescent. Chela
nus less swollen, its ridges less evident than in
male.

Measurements.—Male holotype, length of carapace

3 mm. Female (49290) approximate length of

ual length and width, very convex, subhexagonal; parallel behind antero-lateral angles, the remainder of dorsal surface; cardiac region surrounded by tubercles side by side; cardiac and posterior gas-shallow grooves; posterior margin convex. In ventral view the line of the antennular cavity minute, basal segment of the antenna and the lower border of the mouth in a single transverse line.

Cavity broadly hemispherical; segment of outer maxilliped obliquely-truncate; last segment attached near distal end of dactyl and not overreaching it.

Chelipeds hairy inside; manus much inflated, upper margin convex; fingers equally stout, tips strongly hooked; at base of dactyl, a larger tooth or lobe near middle finger. The chelipeds are shaped much as in *Pinnotheres*, but smaller, specimens of subequal size compared. The ambulatory legs, 1 and 4 are subequal, shorter than 2 and 3; 2 and 3 subequal; propodi convex on anterior and superior margin; dactyli shorter than propodi, curved, that of first leg shorter than the others which are



FIG. 49.—PINNOTHERES
ENDOGNATH OF OUTER
MAXILLIPED OF MALE (40397), X

—In transparent tunicates.

—British Columbia.

1 examined.—

ure Bay, British Columbia; in a transparent tunicate. W. Taylor, collector; 1 male, 1 young female. "A."

British Columbia; in transparent tunicates off Victoria, Canada; 1 male, 1 female holotype (40397).

ons.—The immature female from Departure Bay is almost as narrow as the male, which in other respects resembles. In both the carapace has a more unequal width than the male from Ucluelet which is a little larger, and in at widest part of carapace shows a short raised

PINNOTHERES ORCUTTI, new species.

Plate 22, figs. 5 and 6.

cality.—Manzanillo, Mexico; October, 1910; C. M. Ladd collection; 1 male holotype, dried (49215).

agnosis.—Longer than broad, hairy. Cheliped very long, second longest, fourth shortest; dactyli slender, curved; claws of outer maxilliped minute, attached to distal segment of preceding segment.

Description of male.—Small. Carapace subhexagonal, broadest in posterior half, very uneven, postero-lateral angles produced, forming a small spine-like process.

is largest; dactylus also
nose, and strongly arched.
arrow, length 2.1 and 3.
, 2 longest, 1 and 3 next,
ut equal length; propodi
margins convex except
margin of the second one
straight; dactyli slender,
ubequal, with spinelike

n suboblong, terminal
transversely oblong and
an the sixth segment which has a shallow
n on either side.

-Dorsal surface of dried specimen a dark pu
nt, on posterior margin and posterior half of car
ments.—Male holotype, length of carapace 3.
um.

-Known only from the type-locality.

PINNOTHERES HEMPHILLI, new species.

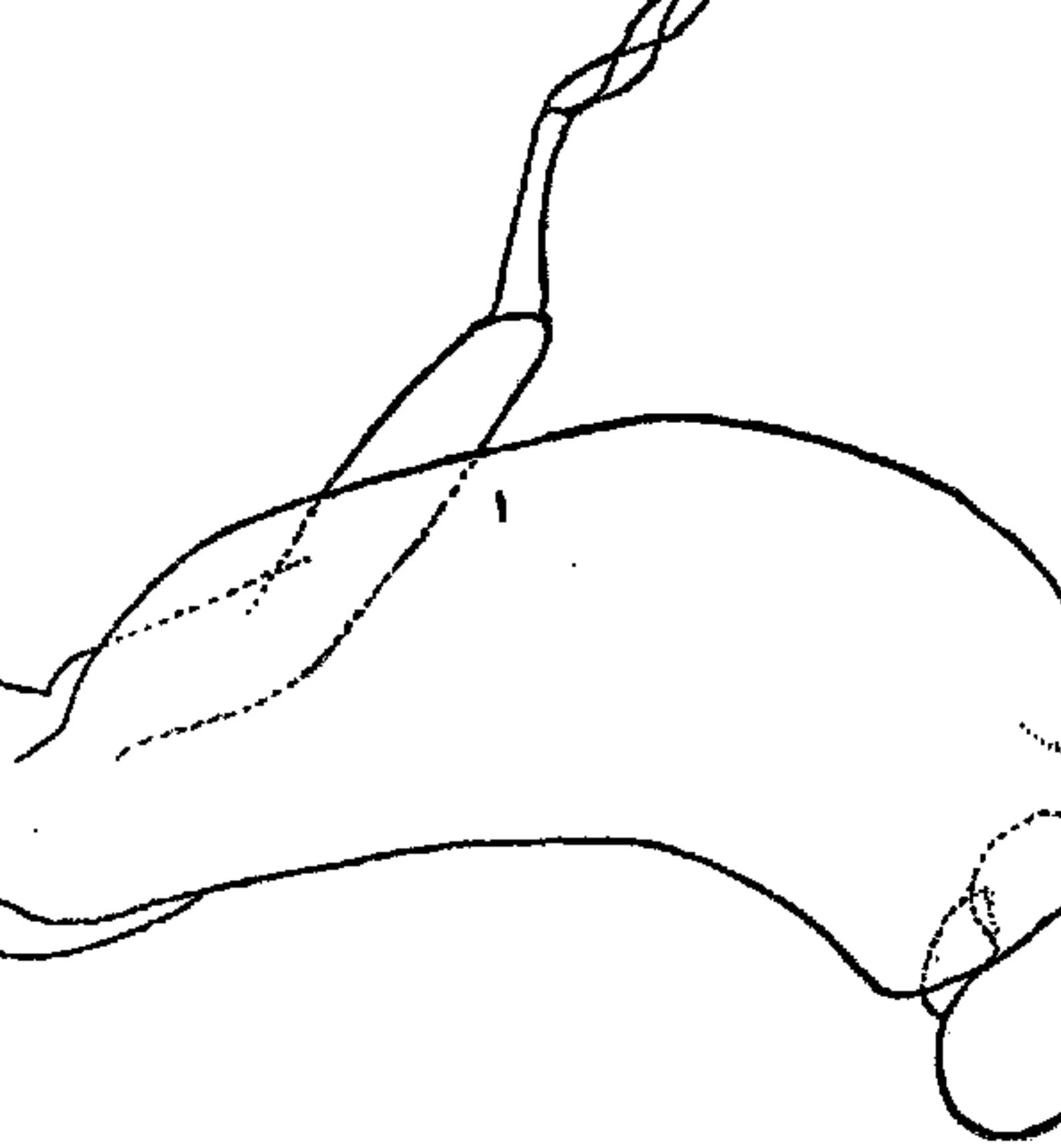
Plate 23.

ality.—Cedar Keys, Florida; between tides; H
ns rare"; 1 male (6420).

is.—Male octagonal. Chelipeds stout. Second



FIG. 50.—*PINNOTHERES* *HEMPHILLI*, new species.
GNATH OF OUTER MAXILLA, HOLOTYPE, $\times 67$.



PINNOTHERES HEMPHILLI, OUTER MAXILLIPED OF MALE HOLOTYPE

length of the legs is expressed by 2.3.1.4; the second longer than the others; and especially is its propodus from the others in its concave posterior margin. Propodus 1 convex, of 3 and 4 straight, anteriorly: dactyli curved, the second one longer and

Carapace nearly one and one-half times wider than long (von Martens).

—In oysters (Gundlach).

—Cuba (Milne Edwards, von Martens); (1).

FIG. 52.—PINNOTHERES GUERINI, OUT OF HOLOTYPE (AFTER MILNE EDWARDS).

PINNOTHERES HIRTIMANUS Milne Edwards.

erces hirtimanus MILNE EDWARDS, Ann. Sci. Nat., ser. 1853, p. 219 [1855] (type-locality, Cuba; type in Paris).

is.—Female?. Maxillipeds as in *P. guerini*. Strongly ciliated on lower margin. (Milne Edwards).

—Cuba (Milne Edwards).

Genus FABIA Dana.

DANA, Amer. Journ. Sci., ser. 2, vol. 12, 1851, p. 290; Sci. Philadelphia, vol. 5, 1851 (1852), p. 253; type, *F. quadrata*.

rotus RATHBUN, Proc. Biol. Soc. Washington, vol. 11, p. 10; *R. subquadratus* Dana.

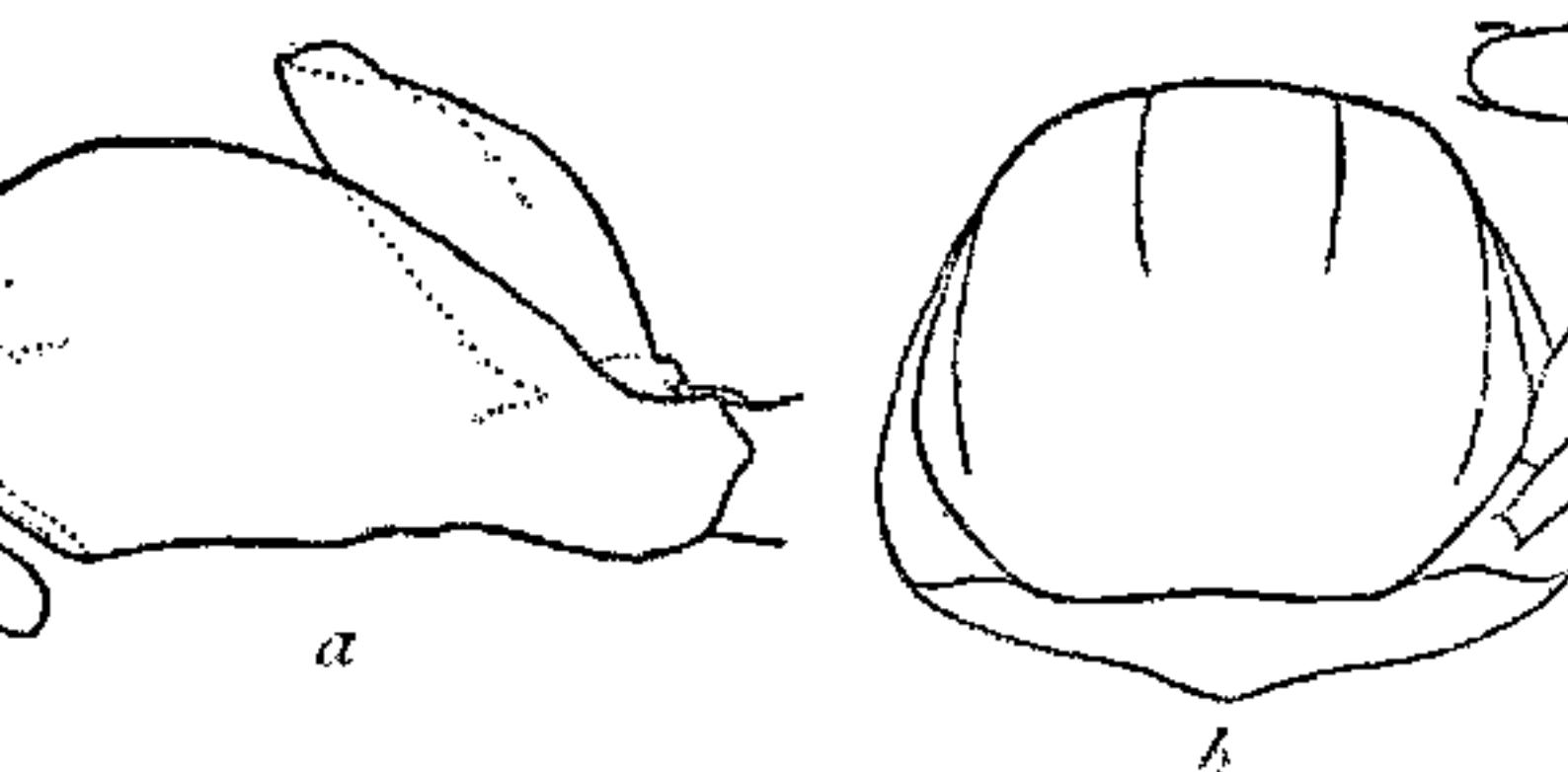
near *Pinnotheres*. Carapace marked by two lobes which extend backward from the upper margin or divide between them the median area. The anterior lobe is so deflexed that the orbital and antennular bases are situated; fronto-orbital distance narrow; fronto-antennular surface, and not forming a projection; eyestalks spherical, corneas small. Terminal segment of outer maxilliped articulating on inner margin.

bquadrata DANA, Proc. Acad. Nat. Sci. Philadelphia, 53 (type-locality, Puget Sound; type not extant); U.S. Expl., vol. 13, Crust., pt. 1, 1852, p. 382; atlas, 1857.

e.—HOLMES, Occas. Papers California Acad. Sci., 7 (part; not specimen from San Pedro, described).

Ilus subquadratus RATHBUN, Harriman Alaska Expl., p. 186 (part; not specimen from Monterey).

s.—Front with transverse, pubescent sulcus. Maxilliped reaches end of penult segment. Pa-



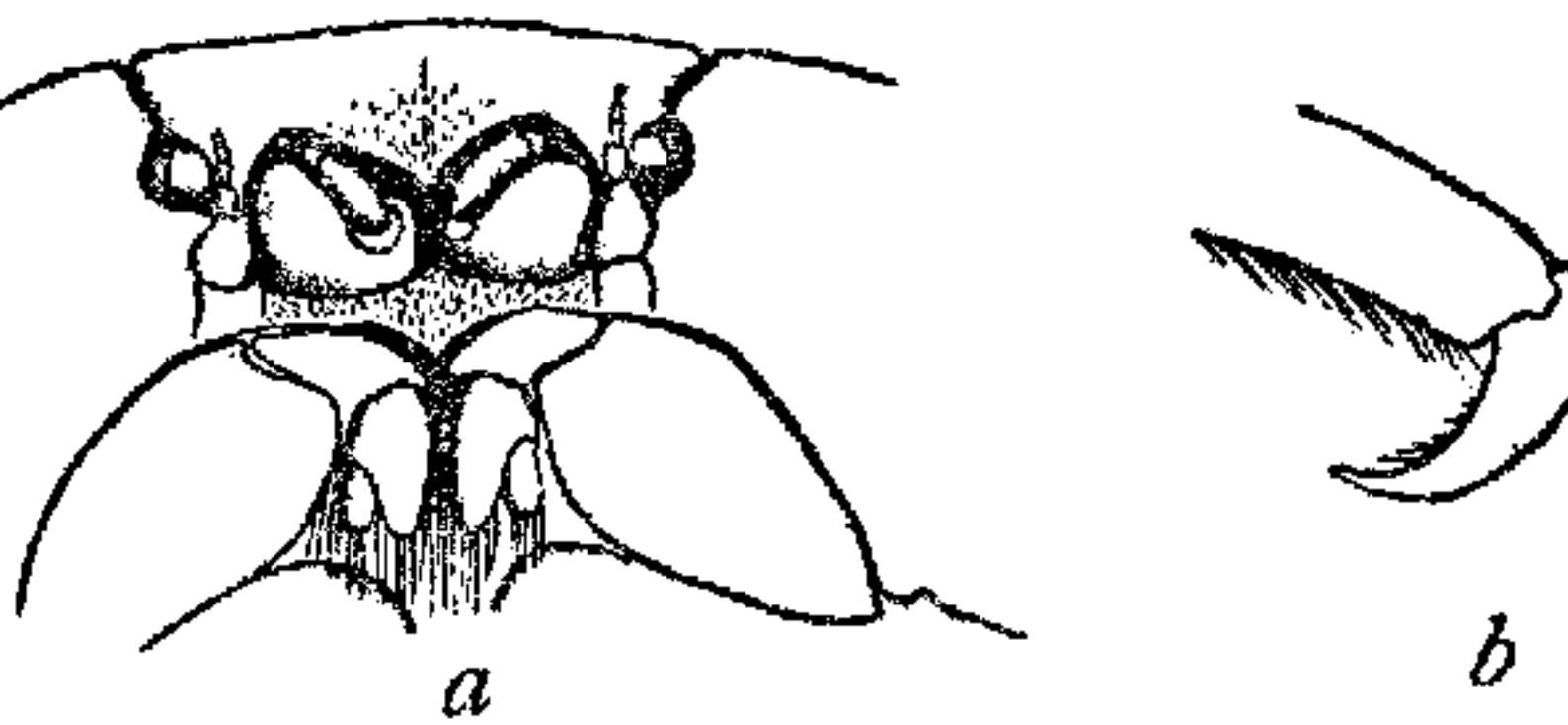
Ilus subquadrata, female. a, OUTER MAXILLIPED (17480), \times 17480; b, RIGHT CHELA, \times 1½; c, FIRST LEG, \times 1½; d, EYE AND LAST TWO LEGS, \times 1½; e, AFTER WEYMOUTH.

Two rows of hair on lower surface of palm, the two end of propodal finger.

Description of female.—Carapace smooth, glossy, membranous in outline with angles broadly rounded; spaces between sulci longer than wide and slightly narrow-

Female (49627), the greater part of the carapace lateral regions and a broad, longitudinal stripe orange chrome in a formalin-preserved specimen whitish.

mens.—Female (23928), length of carapace 10 mm.



A SUBQUADRATA. *a*, VENTRAL VIEW OF FRONT AND MOUTH, ENLARGED.
b, PART OF A LEG, ENLARGED. (AFTER DANA.)

—Commensal in bivalve mollusks.

From off Akutan Pass, Alaska, to Laguna Bay, a depth of 45 fathoms.

examined.—

Entrance to Akutan Pass, Alaska; lat. $53^{\circ} 56'$ N.; 45 fathoms; brk. Sh. P.; temp. 43.5° F.; July 3, 1903, *Albatross*; 1 female (17480).

Gold Bay, Vancouver Island, British Columbia;

is.—Front smooth and naked, without sulcus axilliped does not reach end of penult segment distally. A single row of hair on lower surface

tion of female.—Carapace a little wider than which it strongly resembles. Front without transverse sulcus and without pubescence. Last segment does not reach end of penult segment. The pa-



BIA LOWER, FEMALE (23437). a, END OF OUTER MAXILLIPED, $\times 10$; b, LEFT LEG, $\times 4$.

first leg convex, of last leg slightly concave.

In life, whitish; carapace and abdomen large (Holmes).

—Commensal in bivalve mollusks, namely, *Pholas pacifica*, *Pecten radiata*, *Cardium edule*, *Cardiolaria*, and *Tapes=Paphia*.

Measurements.—Female (23437) length of carapace 1.1 mm.

—California, from San Pedro to San Diego.

Material examined.—

San Pedro Bay; in siphon of *Pholas pacifica*; H.

widen distally, being subparallel, convex; only a few hair on lower surface is continued to end of leg. Fingers less arcuate, more gaping than in *Stenorhynchus*. Posterior margin

—Legs of second pair unlike, right much longer than left; chelipeds feeble, palm widest at distal end. Legs very slender.

On of female.—Of small size. Longitudinal sulci on ventral surface very deep, parallel for greater part of their length, becoming shallow anteriorly and posteriorly where they terminate in a transverse suture on anterior margin.

Second segments of palp of outer maxilliped of female attached behind middle of propodus and nonchelate.

and legs nearly naked. Chelipeds feeble, both palms widening a little distally, margins nearly straight, fingers horizontal, shorter than tips, tips crossing, gape very slight, hairy near base of dactyl.

Legs slender; relative lengths: right 4, left 4; second leg on right side 2½ times (half again) longer than on left; propodites 3 and 4 and left 2 slightly toward distal end, their anterior margins about straight; propodite right 2 half again as long as uniform width and slightly curved; propodite 1 chelate, hairy below distal half; other propodites with a few scattered hairs below; dactyli falcate and curved, right 2 which is longer and less curved than

A BRASSOMIAE, OUTER
OF FEMALE (25648),



Plate 24, figs. 5 and 7.

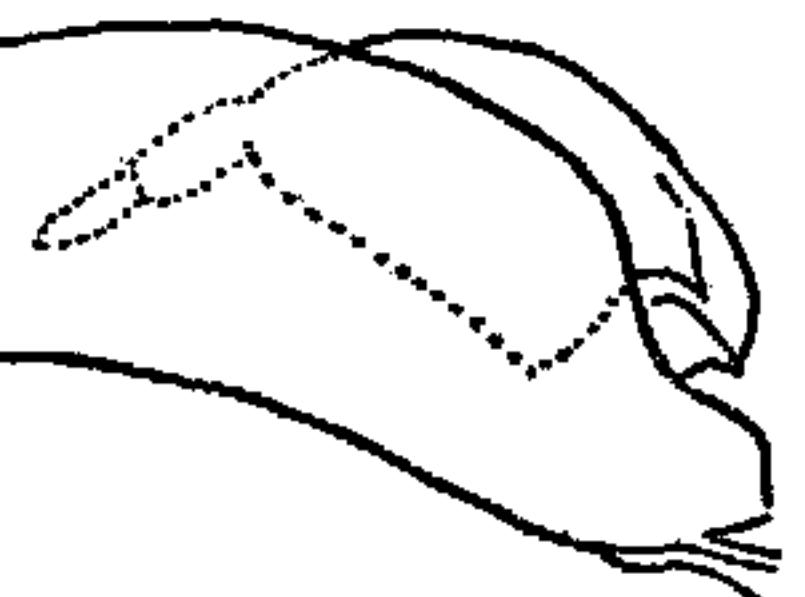
notus subquadratus RATHBUN, Harriman Alaska Ex-
04, p. 186 (part: specimen from Monterey).

Locality.—Monterey, California; in folds of
ucapina crenulata; Dr. C. A. Canfield; 1 holo-
3445.

sis.—Legs of second pair unlike, right much
st leg stoutest. Propodites of legs, except s-

thickening toward
Fingers deflexed.

Description of female
pace of unique specimen
and so crushed as to
most part beyond
Front devoid of hair
a short, longitudinal
pression.



ABIA CANFIELDI, FEMALE HOLO-
TYPE MAXILLIPED, X 21.

segment of palp of outer maxilliped very small
than first segment, and having the narrow t
ched at about its middle.

ubquadrata the palm increases in width to th
rs are longer and inclined downward a little
f the propodus being more markedly sinuous
· fingers not gaping, hairy along inner surface,
middle of dactyl and a smaller one at base

calcified, much broader than long, anterior marginal process deflexed. Orbita nearly round. Mouth transversely plicate, fossettes communicating with front. Buccal area small, very broadly subtriangular. Maxillipeds with ischium rudimentary, merus longer than palp three-jointed, terminal segment joined to the next. First leg largest, others successively diminished, last pair very small. Abdomen of female small, no ova.

to America.

KEY TO THE SPECIES OF THE GENUS *PARAPINNIXA*.

more than twice as wide as long. Dactyli of ambulatory legs large, as wide as their respective merus jointed at middle, meeting, movable finger with basal tooth. Propodus of third legs large, as wide as their respective merus jointed at middle, movable finger with basal tooth. Propodus of first and fourth legs slender, as wide as long, movable finger with tooth near middle. Dactyli of all legs similar.

Movable finger with tooth near middle_____ *atlantica*,
movable finger with tooth near base_____ *bouvieri*.

Dactyli of all legs similar_____ *beauforti*.

ANALOGOUS SPECIES ON OPPOSITE SIDES OF THE CONTINENT.

Atlantic.

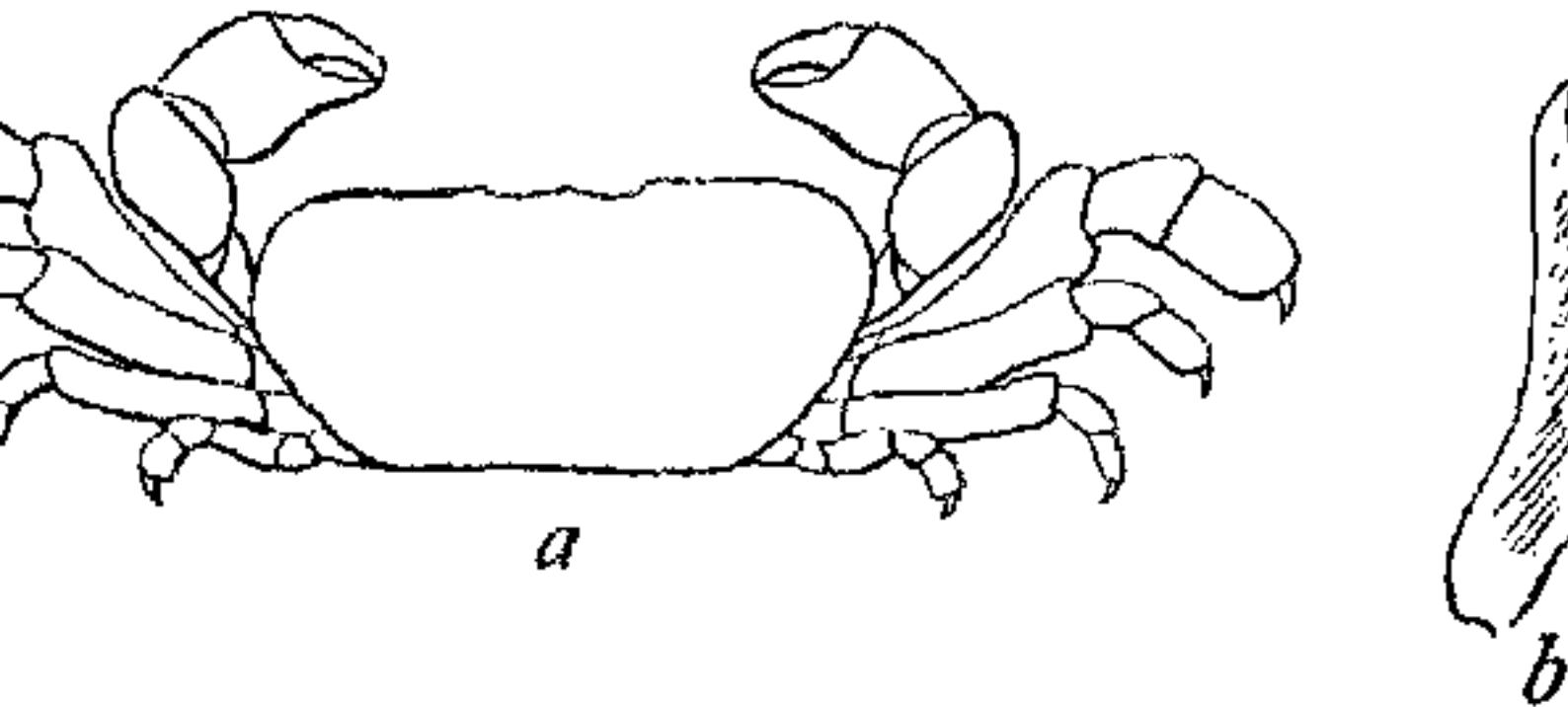
hendersoni

Pacific.

nitida

the very short, curved. Buccal area broadly so in front, posterior portion covered by a flap. Maxillipeds subtriangular, ischium rudimentary; portion nearer the mouth bent inward at a sharp angle; outer face; first joint of palp short and stout, second joint very small.

Legs rather short, moderately stout, smooth; merus and carpus; hand a little compressed, palm thickened.

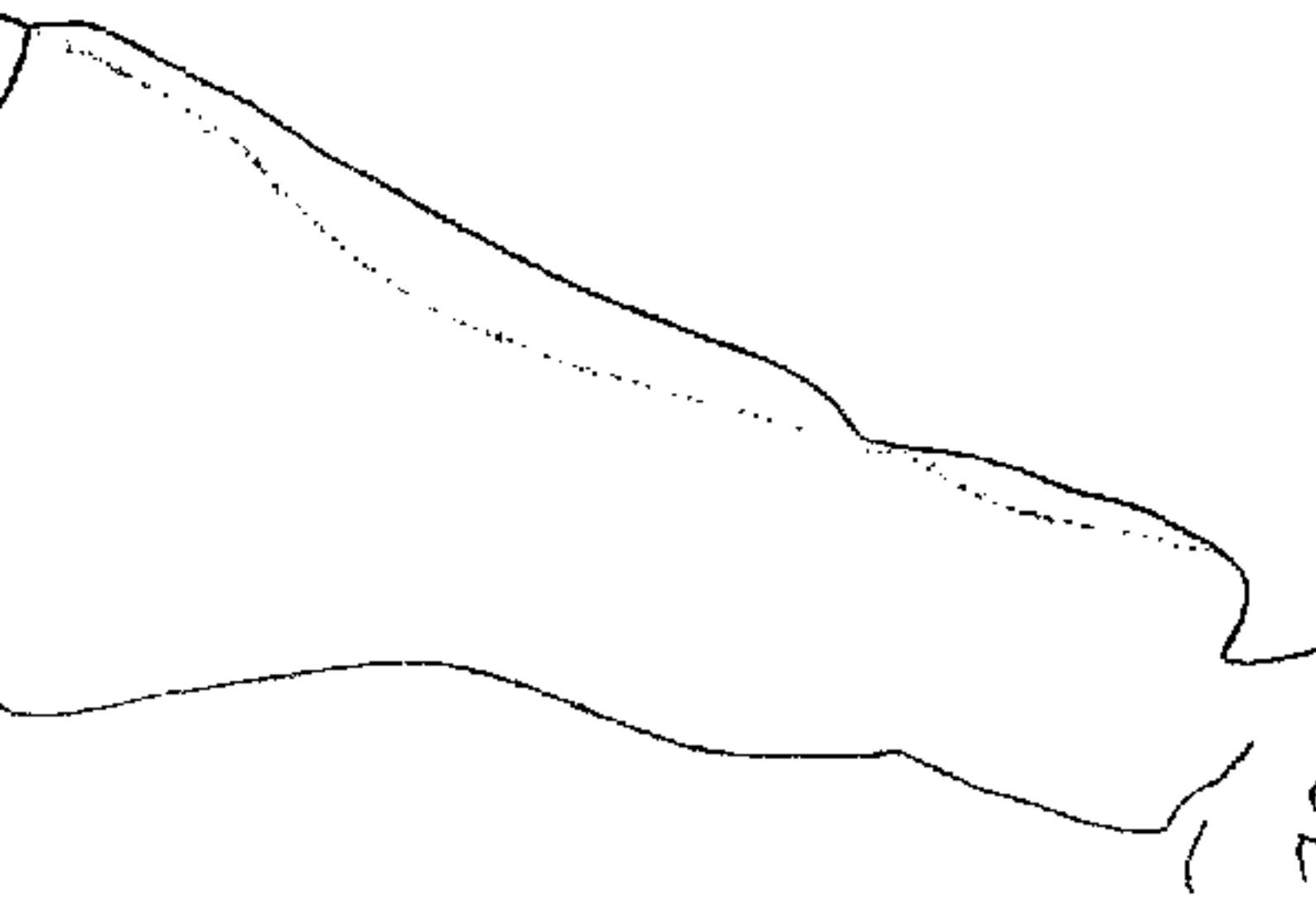


ARAPINNIXA NITIDA, FEMALE HOLOTYPE. a, GENERAL OUTLINE,
MAXILLIPEL, ENLARGED. (AFTER HOLMES.)

Final fingers of short cilia on outer surface; fingers palm, toothless, hooked at tip; on upper surface a line of cilia roughened by minute projections.

Legs articulated on margins; first leg stouter and a little longer than others; anterior surface of merus smooth and concave with a shallow median depression; trochanter

ctyli of legs similar, short and hooked. Pro-
third legs large, as wide as their respective me-
n of male.—Carapace smooth, shining, a little
long, longitudinally very convex, transversely



PARAPINNIXA HENDERSONI, FEMALE (48711), OUTER MAXILLIPE

s arcuate, at the widest part margined by a
pubescent; anterior margin nearly straight, a row
behind margin, fronto-orbital width about one
eighth; front broadly triangular, deflexed, point in
edge marginate and pubescent; further back a
subparallel to frontal margin and terminates
below this groove are three pits in a triangle. Or-

all, not exceeding merus of third, second and first of a size; all the dactyli are similar, falcate, and lie in a corresponding groove on the propodus, the two pairs has a rounded end, but in the last pair the claw is as broad as long.

then broad at base, covering greater part of sternum, segment widest, ends rounded and longer than second segment partly invaginated in third; sides of sternum from fourth to angle near base of seventh; latter very acute at extremity.

Description of female.—Like male, except for the abdomen which is wider compared to sternum, widest at third segment, a little narrower with concave sides, last segment almost an equilateral triangle with each blunt point; segments 1 to 6 of subequal length, 7 to 9 with long hair.

—Specimens in alcohol show small, brownish pubescence.

Dimensions.—Male holotype, length of carapace 2.5 mm.; female (48711), length of carapace 3.5, width

Habitat.—Free-swimming, as all the specimens examined were taken in plankton with a submarine light.

—Cuba; Gulf of Mexico.

Material examined.—Taken on the northwest coast of Cuba by Dr. G. M. Johnson and Bartsch while on the *Tomas Barrera*, 1903-04; as follows:

ove. Antennules oblique. Maxillipeds with palp, but this is uncertain.

stout, smooth; hand thickened, smooth, round; dactyl hooked at tip, armed with a small tooth on inner margin, pollex with two teeth at tip. Others, dactyl short and stout; next two legs longer, dactyls longer; last leg small, reaching above preceding leg, dactyl short and stout. Abdomen, behind which it is triangular, tip broadly not given.

—Dead Mans Island, San Pedro, California.
Type female.

PARAPINNIXA BOUVIERI,¹ new species.

Plate 25, figs. 4-10.

lity.—Off Cape Catoche, Yucatan; 25 fathoms; holotype female, Cat. No. 23441, U.S.N.M.

.—Carapace less than twice or barely twice as long as broad, finger with tooth near tip. Dactyls of second and third legs longer than wide.

tion.—Minute. Carapace not more than twice as long as wide, otherwise much as in *hendersoni*.

Maxilliped when folded in place is triangular, corners rounded and the longitudinal side about



Sides of m
more gradu
gent than in
seventh s
more than o
half times
wide. Sides
lar part of t
men straigh
cave.

PARAPINNIXA BOUVIERI, FEMALE HOLOTYPE.
OUTER MAXILLIPED, $\times 100$.

ements.—Female holotype, length of carapace,
fronto-orbital width 1.1 mm. Male (Charleston)
2, width of same 3.5 mm.

—Charleston, South Carolina, to Yucatan, Mexico.
Specimens examined.—

ston, South Carolina; off the bar; L. Agassiz;
in left branchial chamber (5744, M.C.Z.).

ype Catoche, Yucatan; lat. $22^{\circ} 08' 30''$ N.; long.
fathoms; Co. S.; Jan. 30, 1885; station 2362,
holotype (23441).

PARAPINNIXA BEAUFORTENSIS, new species.

Locality.—Off Beaufort, North Carolina; on fish
of Fishing Buoy (20 miles off Beaufort Inlet);
July 20, 1915; station 8293, steamer *Fish Hawk*;

ssible to
drawing
yet they
ear those

out; car-
in dorsal

er distal angle prominent; palm inflated, margin hairy, width greater at distal than proximal angle higher than base of dactylus; dactylus



PARAPINNIXA BEAUFORTENSIS, OUTER MAXILLAE OF MALE HOLOTYPE, $\times 176$.

especially on the propodites, where there is a border on the margin, and in the second and third legs, a row attached near the upper margin on the posterior length of the

twice as
width of the
the legs di-



FIG. 61.—*PARAPINNIXA BEAUFORTENSIS*, MALE

DORSAL VIEW, WITH RIGHT CHELIPEL DETACHED.

as long as upper palm; both fingers curved; when clasped, tips cross and the gape, the thin regularly dentated edges fitting together.

Legs fringed



ndicated (1) by its small size; (2) by the eyes to the size of the body, as in most zoeae; the feathery ornamentation of the legs and c in maintaining a pelagic existence; and (4) by edges of the fingers, which suggest that in a they might disappear and leave narrow, gaping f

Genus DISSODACTYLUS Smith.

Dissodactylus SMITH, Trans. Connecticut Acad. Arts and S 172; type, *D. nitidus* Smith.

Inophilus RATHBUN, Amer. Nat., vol. 34, 1900, p. 590; Rathbun.

pace broader than long, pentagonal, broad be ro-lateral angles; surface not areolated; front its margin continuous with arcuate antero-la minute, superior margin of orbit slightly or not Antennules transverse. Epistome usually very al border approaches very near the front, space, which is nearly filled by the antennul is not interrupted in the middle by any projec and is continuous with lateral margin of buccal longitudinal ridges.

um and merus of maxillipeds coalescent; pa or three segments, the dactylus, when present, ipeds of moderate size; fingers longitudinal.

gin more or less truncate, while the palpus is relatively, the carpus and propodus nearly equal quadrilateral, in two instances bearing a distal inner corner, in two instances lacking a rudiment. In the *nitidus* there is evidence of a rudiment. In the basal portion of the merus is suboval, narrowing to the end.

The palpus is very small, its three joints folded in a groove in the edge of the merus, especially the dactylus, are easily broken off.

KEY TO THE SPECIES OF THE GENUS DISSODACTYLUS.

Fourth ambulatory leg simple, not bifurcate. Carapace with one dorsal ridge on each side. Antero-lateral margin

with a dorsal ridge on either side proceeding inward at angle. Legs not slender.

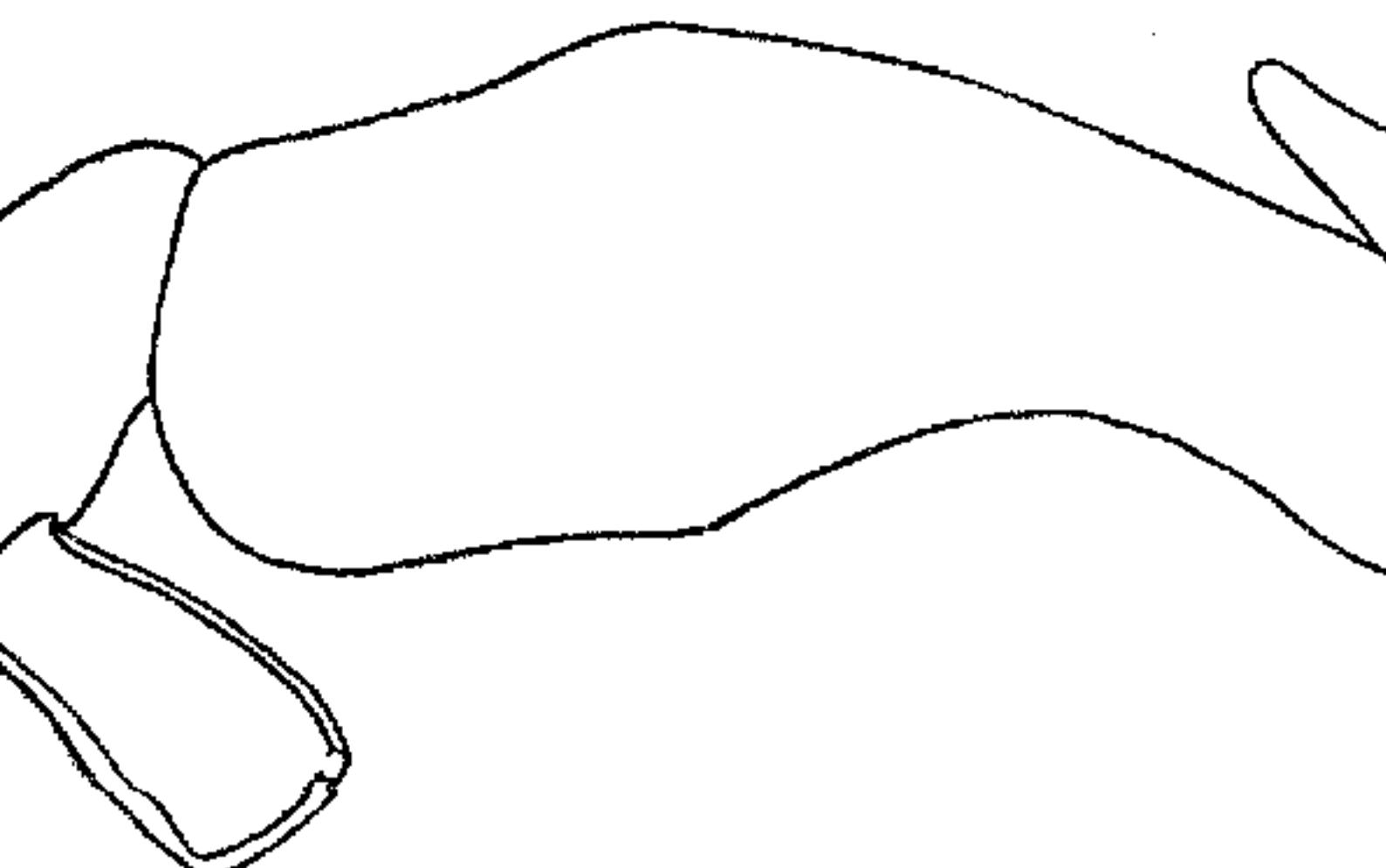
Edge oblique.

Large spine of dactyls of legs 1, 2, and 3 of good size. Dactyls of legs 1, 2, and 3 bifurcate half way to their base. Edge of front transverse. Carapace flat for the most part, narrow, being only one-twelfth wider than long.

nitidus

Edge of front concave. Carapace very convex and wide, one-fifth wider than long-----*mellitae*
Dactyls of legs 1, 2, and 3 bifurcate less than halfway

cription of male.—Carapace broad posteriorly, margin but little less than between lateral margins about as long as antero-lateral. Dorsal polished, slightly convex in front and along lateral middle and posteriorly. Antero-lateral border s



64.—*DISSODACTYLUS NITIDUS*, OUTER MAXILLIPEL OF FEMALE

with an upturned margin which curves suddenly at angle and extends one-third of way to middle. Antero-lateral border nearly straight and armed with sharp margin.

Distal half of merus of outer maxillipeds suboblong, parallel sides, distal angles rounded; segments often flexed reaches anterior margin of sternum;

ge, terminal portion on both edges. (Smith.)
of female.—The female resembles the male
margin of carapace is a little concave. The al-
l of the sternum but
reach the extremity;
e, second nearly twice
, third, fourth, fifth,
subequal length and
ng as second; seventh
-third as wide and
long as sixth, sides

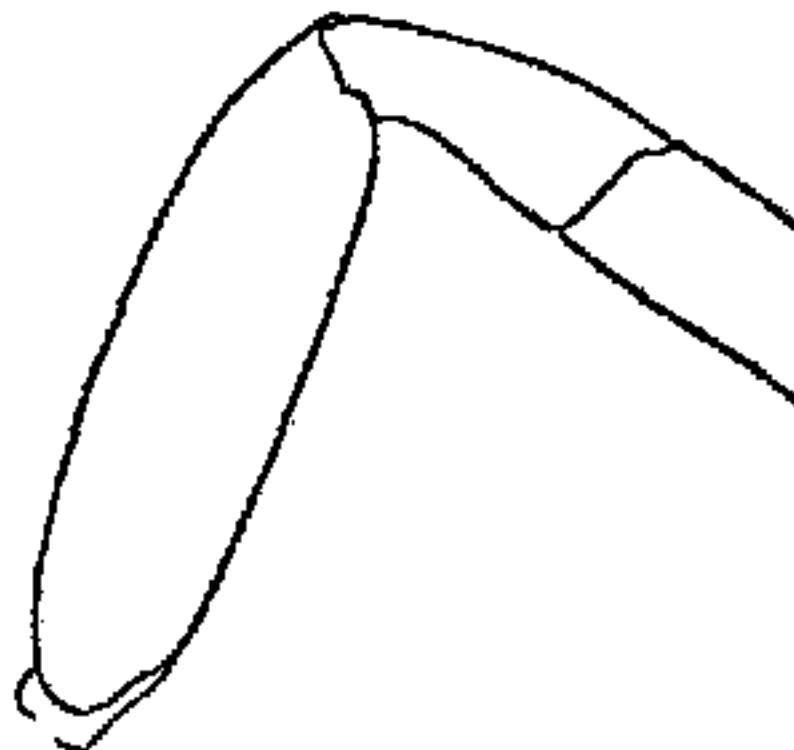


FIG. 65.—DISSODACTYLUS
THIRD LEG OF FEMALE (22113)

alcohol, dirty white;
marked with irregular,
spots of purplish brown, and divisions of dactyli
tipped with dark brown. (Smith.)

s.—Male holotype, length of carapace 4.7, width
Female (22113), length of carapace 5.5, width
m Santa Maria Bay, Lower California, Mex-
depth of $5\frac{1}{2}$ fathoms.

mined.—

Santa Maria Bay, Lower California; in boat dredge; May 4, 1888; 3 males, 1 female (49229).

Point, Lower California; lat. $26^{\circ} 42' 30''$ N.
V.; $5\frac{1}{2}$ fathoms; gn. M.; May 4, 1888; station

and bearing a fine, raised, milled rim, which curves inward on the carapace at an obtuse angle and is continued on the dorsal surface for a short antero-lateral distance; postero-lateral

straight, anteriorly

Me

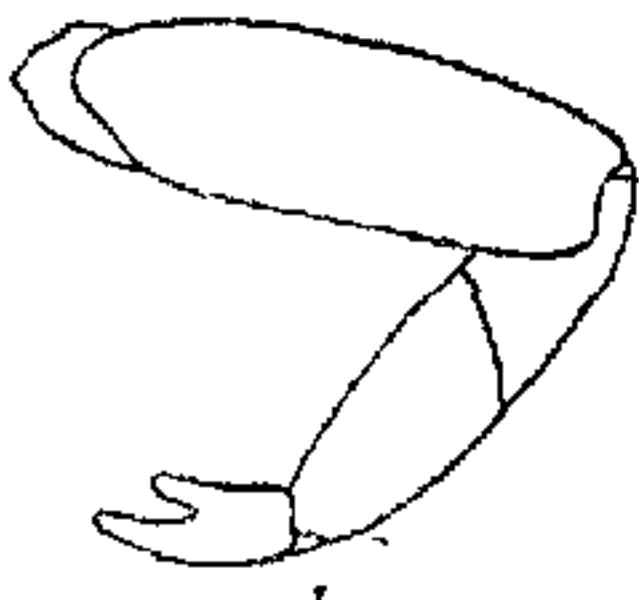
outer
spatula
of ca
propod
wider
dactyl

Ch

moder



a



b

—DISSODACTYLUS MELLITAE. a, OUTER MAXILLA OF FEMALE (40272), $\times 23$; b, LEG OF PARATYPE (4), $\times 15$.

and carpus smooth, propodus roughened with punctate and hairy on their superior-distal side, convex, lower sinuous; fingers a little deflexed, strong in proximal half, a depressed line of punctae on entire, tips blunt. Chelipeds of female similar, hairy on edges, compressed; merus joints very slender with convex anterior and posterior margins, gradually tapering, especially in last leg; the dactylus divided halfway to base, forks slender, curving fork twice as long as posterior; dactylus 4 slightly longer than 3.

sha Bight, Marthas Vineyard, Massachusetts; Fisheries Lab., Woods Hole).

part of Vineyard Sound, Massachusetts; 11½ fms.; 1 specimen (U. S. Fisheries Lab., Woods Hole).

Batt Bay, Rhode Island; Beaver Tail Light S. E. of Batt Bay; S. Sh.; Aug. 6, 1880; station 770, *Fish Hawk*; males, ovig. (40271).

Batt Bay; E. of Brentons Reef Lightship; 8½-10 fms.; Aug. 23, 1880; stations 816-818, *Fish Hawk*; females, ovig.) (40272).

North Carolina: Union College Collection, New York (deposit, U.S.N.M., Cat. No. 42788). Union Co. 57c; 1 female (deposit, U.S.N.M., Cat. No. 42789).

South Carolina; Feb. 8, 1852; L. Agassiz; M. C. Z.).

Florida; on *Mellita quinquesperforata*; J. E. Gray (1 male is holotype) (23434).

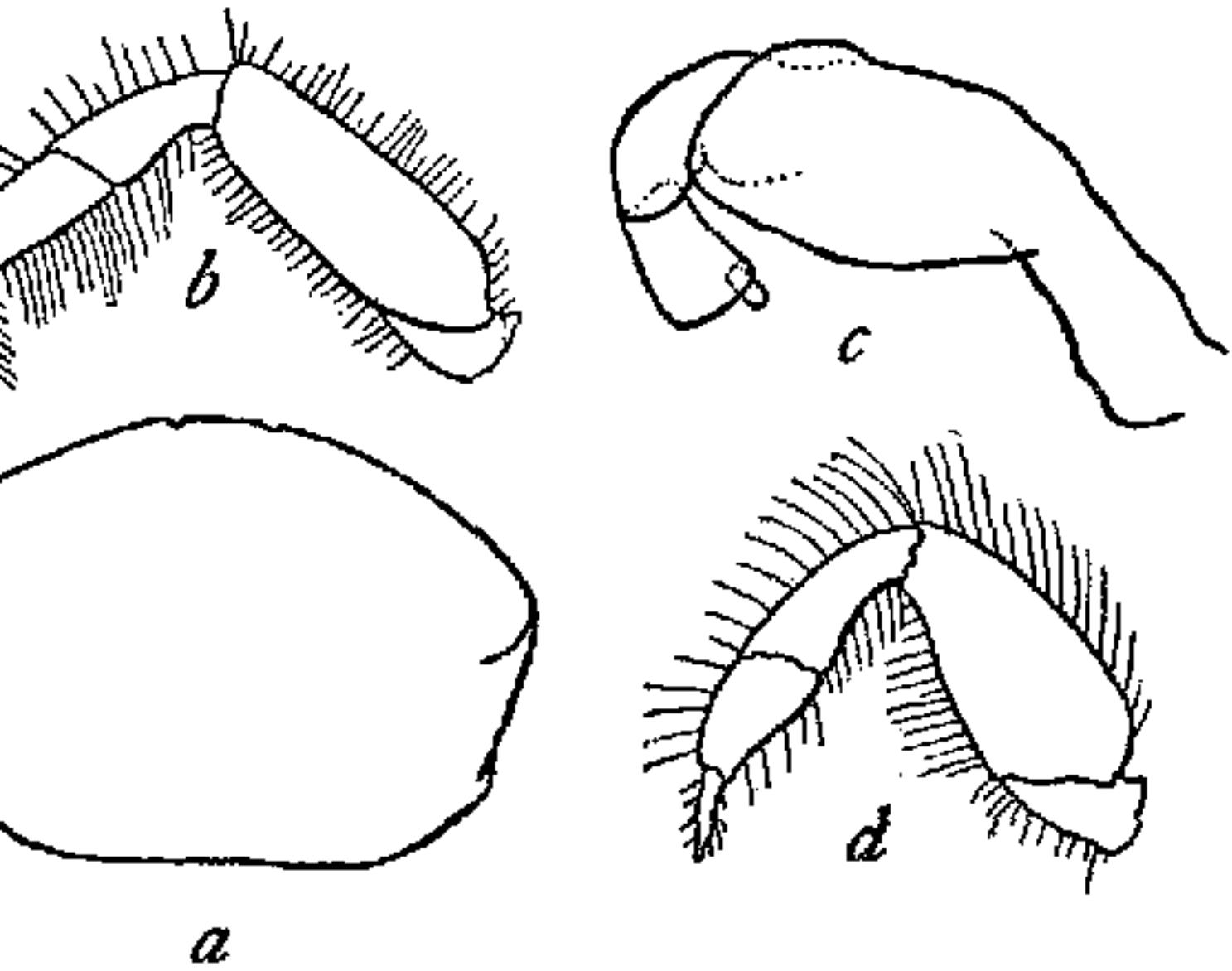
DISSODACTYLUS ENCOPEI Rathbun.

Plate 27, figs. 1-4.

Dissodactylus encopei RATHBUN, Bull. U. S. Fish Comm., vol. 20 (1901), p. 22, text-fig. 5 a-e (type-locality, Stann Creek, off Belize, British Honduras; holotype, Cat. No. 23430, U. S. Natl. Mus.). *Dissodactylus trinitatis* MORELKA, Arch. Mus. Nac. Rio de Janeiro, pl. 1, p. 37, pl. 3 (type-locality, State of Rio Grande do Norte, probably near Parauapebas town in Mts. Nas. Rio Grande).

long as carpus, widening distally, truncate, and emarginate at inner angle, a short, stumpy dactylus.

and upper surfaces of carpus and propodus by oblique rugae fringed with hair; propodus



DISSODACTYLUS ENCOREI, MALE (23430). *a*, OUTLINE OF LEG, $\times 16$; *c*, ENDOGNATH OF OUTER MAXILLIPED, $\times 46$; *d*, FEMUR AND TIBIA, $\times 16$.

cal; upper margin nearly straight, lower margin reflexed, grooved, meeting when closed, tips acute; base of dactyl fitting in sinus of propodal finger; more slender than of male.

Sparingly fringed with long hair; dactyli 1-3

rom west coast of Florida to Rio Grande do Sul
28 fathoms.

examined.—

of Florida; lat. $26^{\circ} 47' 30''$ N.; long. $83^{\circ} 25'$
ne. wh. S. bk. Sp. brk. Sh.; Mar. 18, 1885; stat-
e female (23432).

of Florida; lat. $26^{\circ} 33' 30''$ N.; long. $83^{\circ} 15'$
fne. wh. S. bk. Sp.; Mar. 18, 1885; stat-
e male (23433).

on underside of sand-dollars buried in sand;
Andrews; one male, three females (41751).

s, Porto Rico; Cape San Juan Lighthouse N.
2 fathoms; Co. S. Sh.; temp. 26.2° C.; Feb.
Fish Hawk; one male y. (24524).

k, 38 miles S. of Belize, British Honduras; att-
of *Encope emarginata*; W. A. Stanton; 14 s-
pecimens (1 male is holotype) (23430).

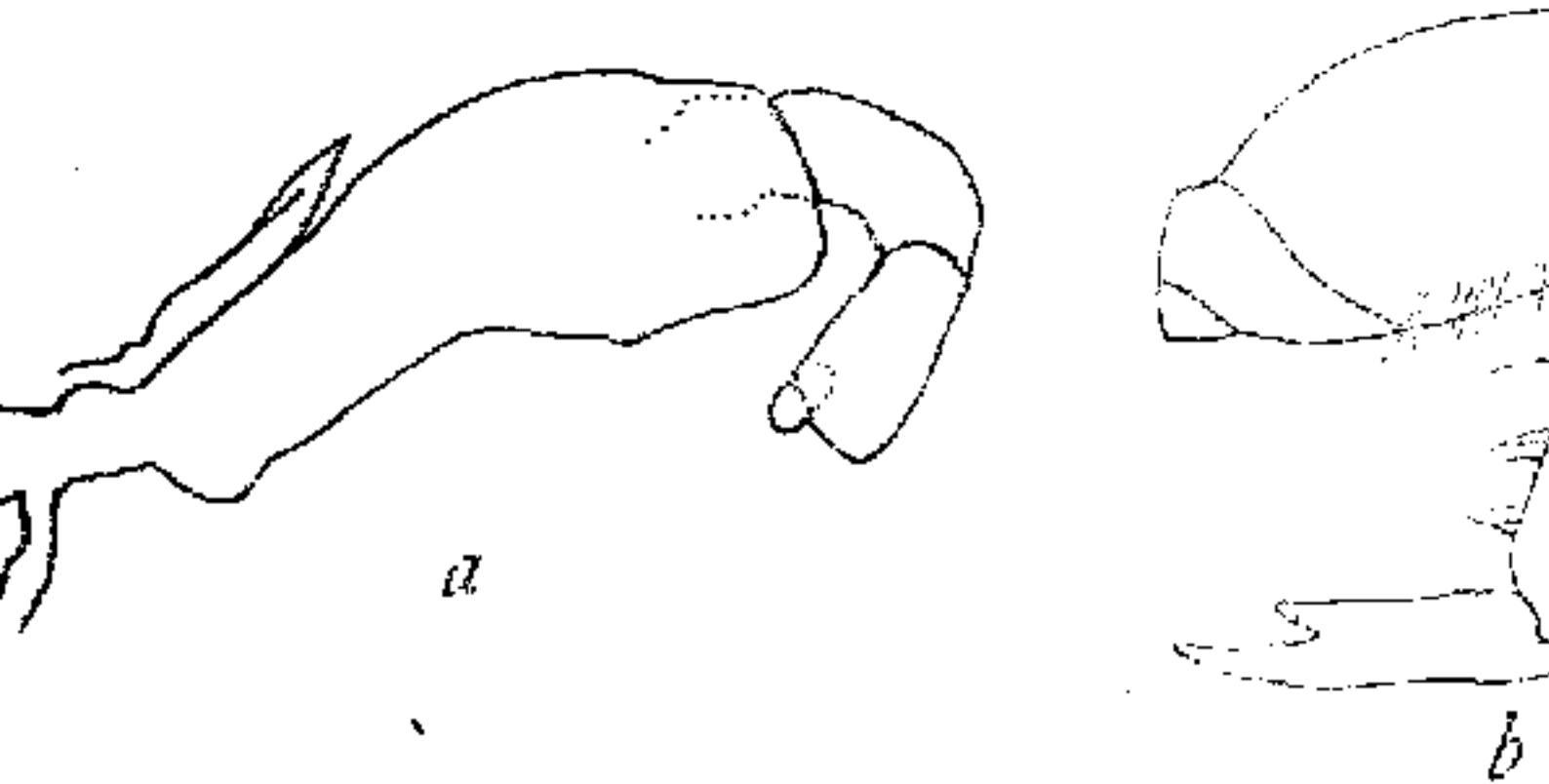
Colombia; Mar. 16–22, 1884; *Albatross*; three

DISSODACTYLUS BORRADAILEI,¹ new species.

Plate 27, figs. 5–8.

ty.—Miami, Florida; 30 fathoms; John B. He-
(Cat. No. 40220 U.S.N.M.)

; carpus and propodus of good size, the latter ward distal end, outer two-thirds of distal margin indented angles; inner third less produced and a short, broad dactylus which overreaches the s and propodus of chelipeds ornamented with olives; propodus thick, distally diminishing; pa



DIADACTYLUS HORRIBILIS, FEMALE (49231). a, OUTER MANUS;
b, LEG, $\times 11$.

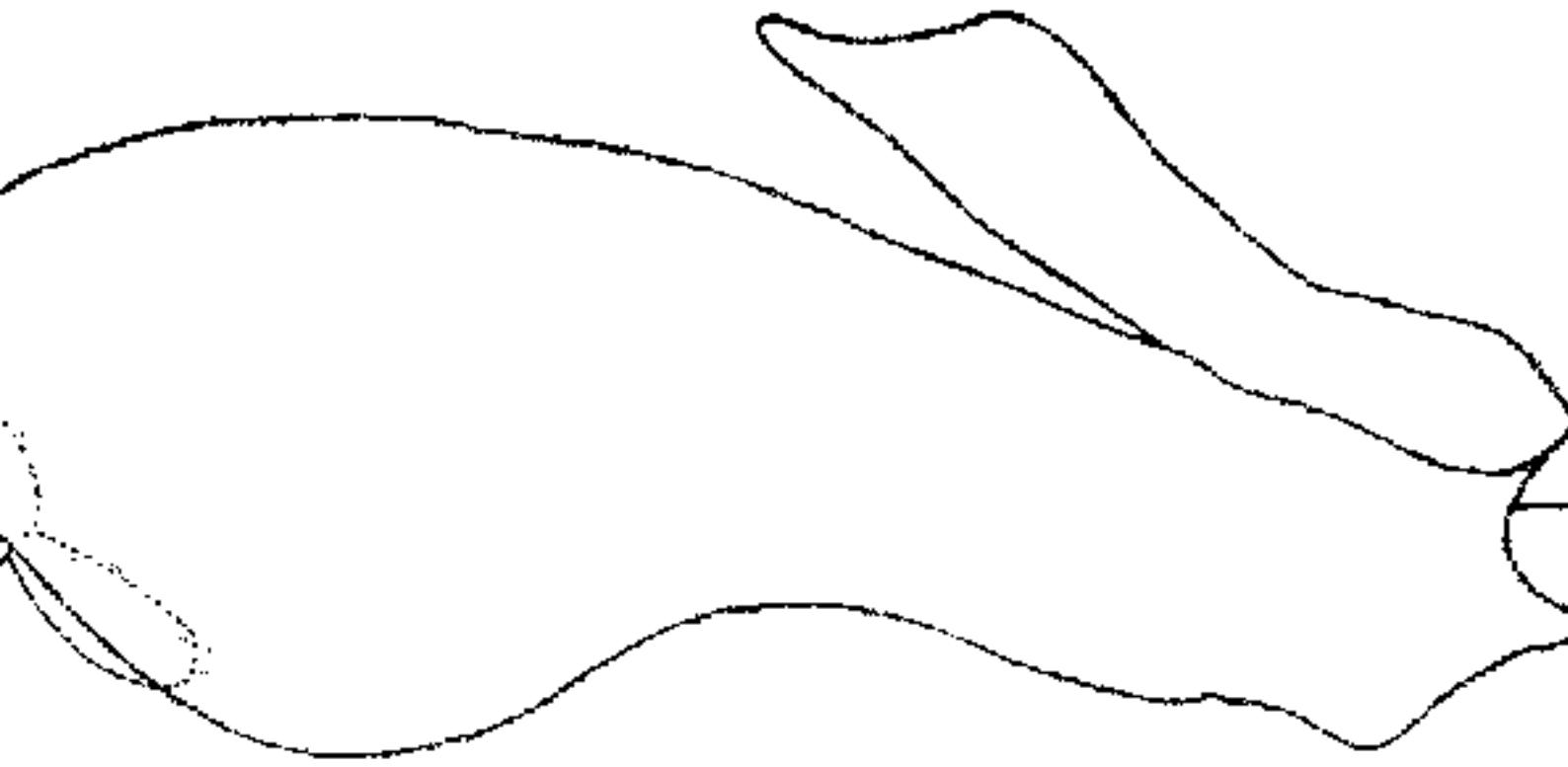
vex below in proximal two-thirds; fingers stout; margins crenulate, meeting when closed, tips and overlapping.

short, stout, long-hairy; merus about twice as long, nearly straight, tapering to a slender, slightly curved tip; in the first three legs there is a slender, minute, subequal spine on the posterior margin, a little distal to the middle.

DISSODACTYLUS STEBBINGI,¹ new species.

Plate 28, figs. 1 and 2.

locality.—Sarasota Bay, Florida; Union College male holotype (deposit U.S.N.M., Cat. No. 4922).—Antero-lateral margin a thin rim. Dorsal teeth covering one-third width of carapace. Side from third to sixth segment, inclusive, nearly as wide as long, margin arcuate. Palps 3-jointed.



DISSODACTYLUS STEBBINGI, OUTER MAXILLIPED OF MALE HOLOTYPE.

Description of male.—Carapace widest at the lateral antero-lateral margin beginning at lower edge of orbit and rim which at widest part of carapace turns inward and continued by the less prominent, concave, post-

-Known only from Sarasota Bay, Florida.

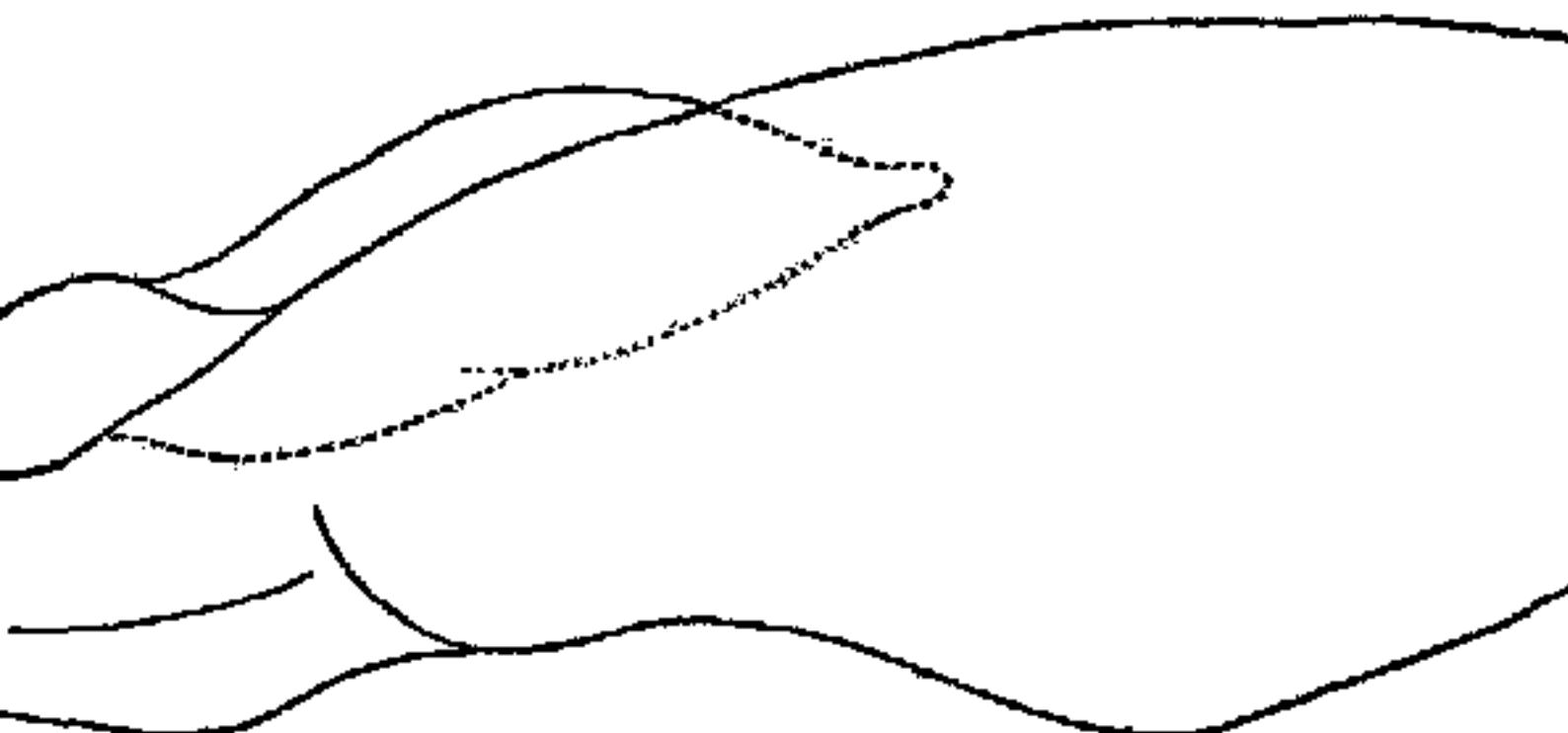
DISSODACTYLUS ALCOCKI,¹ new species.

Plate 28, figs. 3 and 4.

Locality.—Gulf of Mexico, off Delta of Mississippi, station 2388, *Albatross*; 1 female holotype (Cat.

Diagnosis.—Carapace without dorsal ridge. Front bill spinulous; secondary spine of dactyls 1 to spine. Palp of outer maxilliped 3-jointed.

Description.—Carapace convex fore and aft, nearly level, postero-lateral margin acute, with a milled rim at



DISSODACTYLUS ALCOCKI, OUTER MAXILLIPED OF FEMALE HOLO-

rounded lateral angle and continued along oblique postero-lateral margin; no dorsal ri-

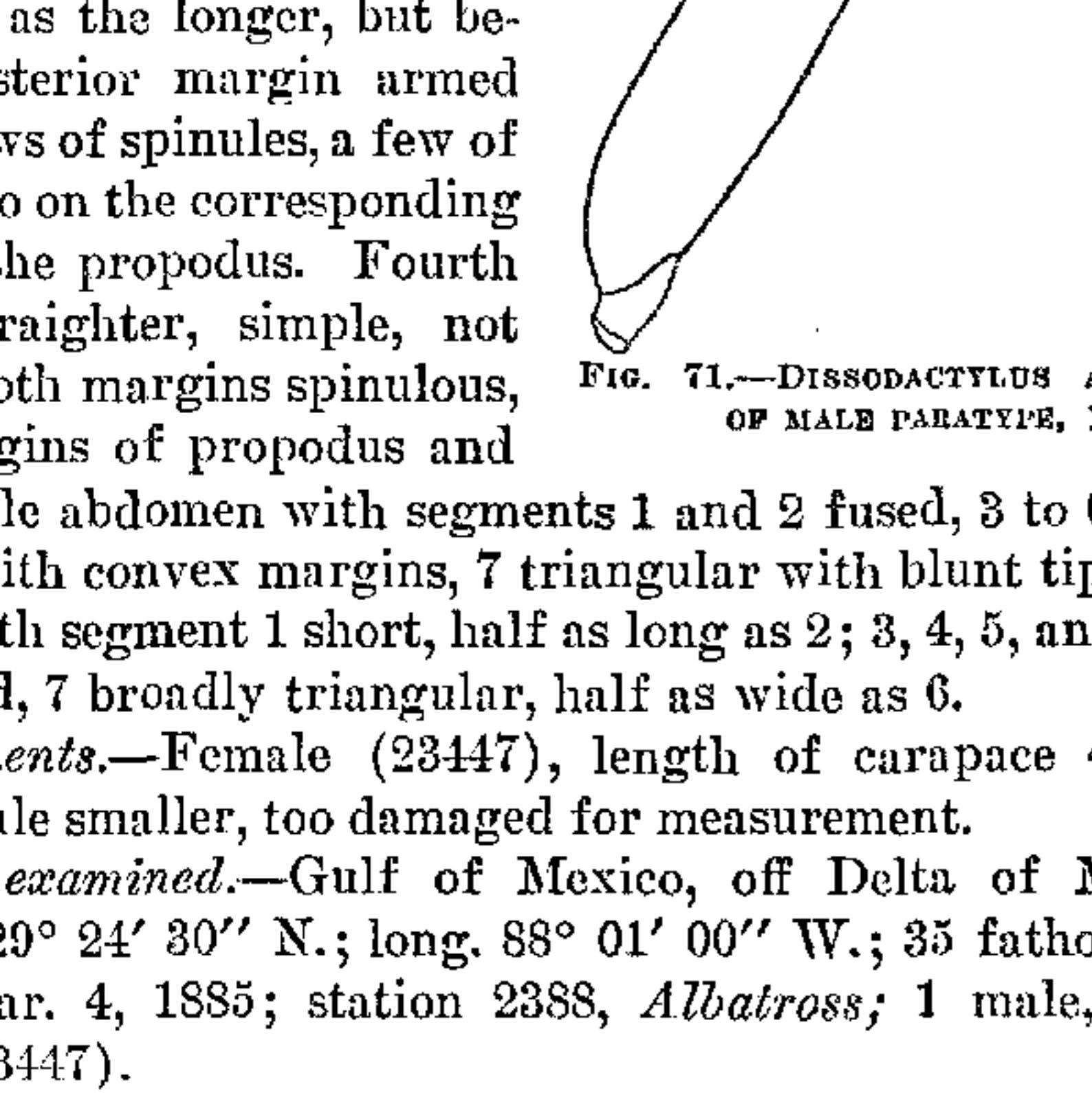


FIG. 71.—DISSODACTYLUS
OF MALE PARATYPE.

le abdomen with segments 1 and 2 fused, 3 to 6 with convex margins, 7 triangular with blunt tip; 8th segment 1 short, half as long as 2; 3, 4, 5, and 6, 7 broadly triangular, half as wide as 6.

Material.—Female (23447), length of carapace 16 mm., male smaller, too damaged for measurement.

Localities.—Gulf of Mexico, off Delta of Nueces River, 29° 24' 30" N.; long. 88° 01' 00" W.; 35 fathoms; Mar. 4, 1885; station 2388, *Albatross*; 1 male, Cat. No. 49233 (23447).

DISSODACTYLUS CALMANI,¹ new species.

Plate 28, figs. 5 and 6.

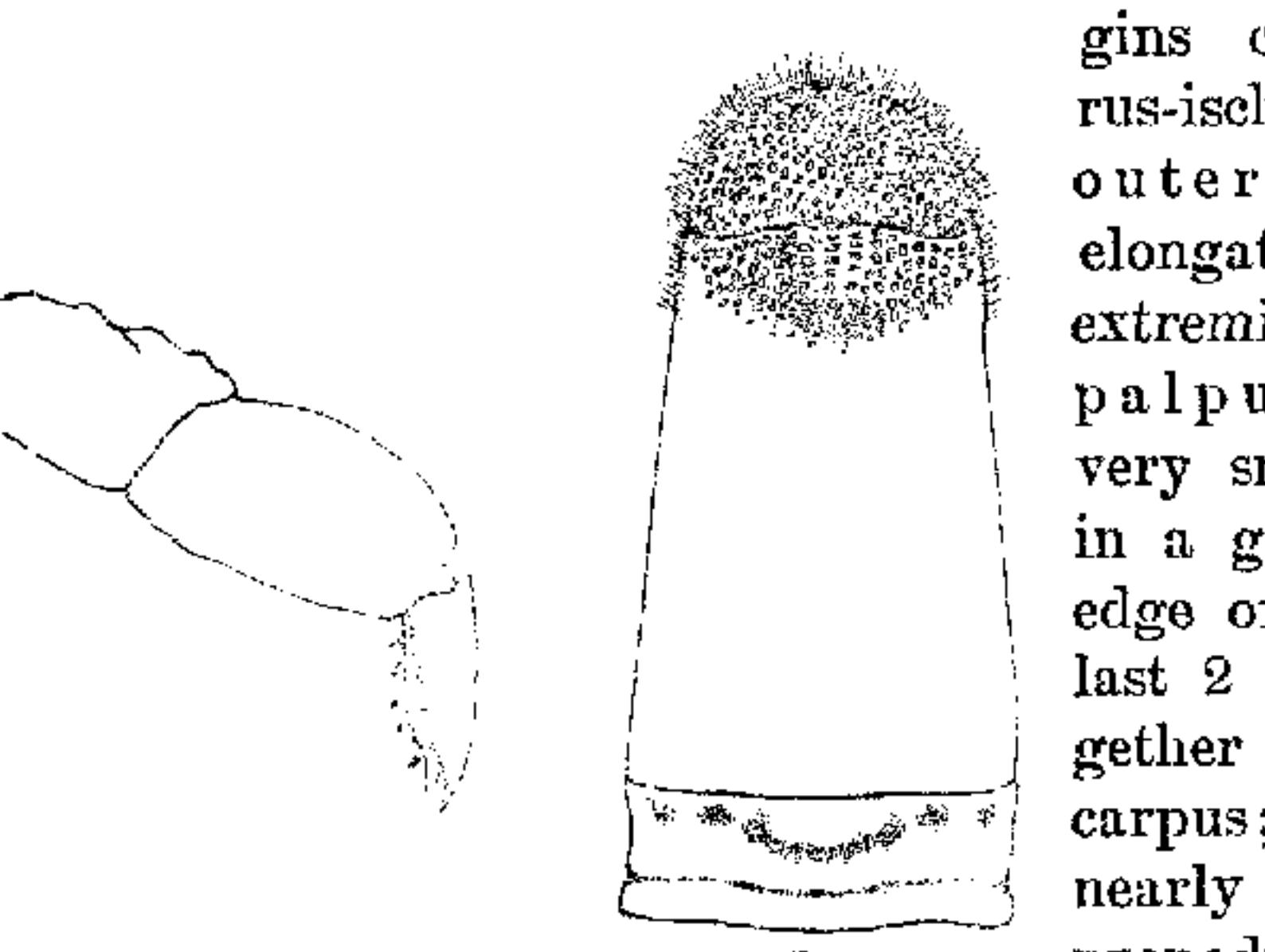
Material.—Grecian Shoals, Hawk Channel, Florida Keys, Cat. No. 7469, Fish Hawk; 1 female (Cat. No. 49233, U. S. N. M.); 1 male (Cat. No. 49234, U. S. N. M.).

External Characters.—Carapace sharply pentagonal, covered with small tubercles, all margins dentate. Dactyl of legs 1 to 4 bifurcated.

—*DISSOOACTYLUS CALMANI*, OUTER MAXILLIPED OF FEMALE (4)

others almost crenations. Front produced, thin transverse, but faintly bidentate or even quinque-dentate; margin of orbit narrow, cut deeply into carapace thickened.

Surface of carapace hairy. Pterygostomian ridge short near epistome. Buccal cavity subtriangular;



a

b

the tooth at the lateral angle and the ridge less prominent in the male than in the female. The ratio is proportion to their length. The abdomen tapering to the distal end; the terminal segment is semicircular. Female (50168) has the legs banded with brown, which band covers the proximal half or two-thirds of the femur and occupies the major part of the propodus; on the tibiae it is less than half the merus and the distal third. There are three transverse stripes of brown on the first three segments of the abdomen.

Measurements.—Female (holotype), length of carapace 4.0, width 2.5, height 1.5, width of eye 0.5, width of cheliped 1.5 mm. Female (50168), length of carapace 5.5, width 3.5, height 2.0, width of eye 0.6, width of cheliped 2.0. Male (50168), length of carapace 4.6, width 2.5, height 1.5, width of eye 0.5, width of cheliped 1.5.

West Florida; northwest Cuba. 2 to 4 fathoms.

Examined.—

10 specimens, 1 male holotype, Hawk Channel, Florida; $\frac{1}{2}$ mile S. W. of Key West, 2 fathoms; S. G.; Feb. 19, 1903; station 74. 1 male holotype (49233).

1 male, Hawk Channel, Florida; 4 fathoms; water temperature 69.5° F.; Dec. 20, 1912; station 4, haul 2, *Fish Trap*; female ovig. (50168).

1 female, Cuba; Reef Laveros Italiendas, opposite Cayo Largo; Co. S. R.; June 2, 1914; Henderson and Steyermark Exped.; 1 female (48570).

so -----
joint of outer maxilliped articulated at distal end of p
second leg longest.
ximal end of last joint of outer maxilliped narrow, c
multimate joint wide. Carapace uneven. Spinules o
egs -----
ximal end of last joint of outer maxilliped same wid
of penultimate joint. Carapace smooth. No spinules
egs ----- Pin

Genus PINNIXA White.

ixia WHITE, Ann. Mag. Nat. Hist., vol. 18, 1846, p. 177
trica White.—RATHBUN, Bull. U. S. Fish Comm., vo
ot. 2 (1901), p. 21.

cola LOCKINGTON, Proc. California Acad. Sci., vol. 7,
55 [1]; type, *T. longipes* Lockington.

pace much wider than long; integument usually
nearly transverse, with a median groove. Eye
nearly circular, with a wide inner hiatus, w
l by the basal antennal joint. Antennules tri
ply plicated in wide fossettes which communic
n beneath the front. Eye-stalks very short. Ep
use. Ischium of maxillipeds small, merus large
outer margin convex; palp jointed to summit or
articulated on inner side of the preceding one near
peds of moderate size; merus trigonous; ca
hand large, compressed. Second ambulatory l

only.

Cheliped distinctly developed.

Claw of third leg strongly falcate, the corneous tip bending to the general outline of the segment. Females much larger than males.

Claw of third leg of male more than twice as long as wide. Female not gaping. Thumb of male horizontal. Carapace

-----*faba*
Claw of third leg of male twice as long as wide. Fingers closing. Thumb of male deflexed. Carapace pointed at side.

littoralis

Claw of third leg straight or slightly curved, the corneous tip bending to the general line of the segment.

Claw of third leg when extended not reaching end of merus of third leg; carapace very wide, nearly 3 times as wide as long. Thigh enormously large in proportion to body.

Merula stout. Propodus of second leg wide-----*longipes*
Merula feeble. Propodus of second leg narrow.

tubicola, young

Carapace twice or little more than twice as wide as long; cheliped not enormously large in proportion to body; merus twice as long as wide-----*floridanus*

Claw of third leg when extended reaching end or beyond end of second leg.

Propodus of third leg slender, twice or more than twice as wide.

Carapace twice as wide as long; a cardiac crest present-----*sayana*

Carapace less than twice as wide as long; no cardiac crest-----*minuta*

- wide ----- chad
- J¹. Merus of third leg elongate, much more long than wide.
- K¹. Thumb subtriangular, the terminal spine point of the triangle.
- L¹. Two short, well separated cardiac slightly deflexed-----va
- L². A single, bilobed cardiac crest. Thum flexed-----oce
- K². Thumb composed of a short, high, qu lowed by a short, slender spine at le
- L¹. Palm strongly widened distally, low straight. Cardiac ridge blunt-----v
- L². Palm very convex below. Cardiac ri
- H². Thumb not deflexed.
- J¹. Thumb straight or nearly so. Lower margin convex.
- K¹. A cardiac ridge present. No large spine third leg in male-----fro
- K². No cardiac ridge present. A large spine third leg in male-----
- J². Thumb curved upward distally. Lower margin convex.
- K¹. Carapace more than twice as wide as of third leg longer than propodeal female gaping-----
- K². Carapace less than twice as wide as long
- L¹. Carapace laterally tapering. Sides convex-----
- L². Carapace laterally tapering. Sides convex-----

North Pacific.
occidentalis.

South Pacific.
valdiviensis.

INNIXA TRANSVERSALIS (Milne Edwards and Lucas).

Plate 20, figs. 1-3.

transversalis MILNE EDWARDS and LUCAS, d'Orbigny's Mém., vol. 6, pt. 1, 1843, p. 23 (type-locality, Chili; type locality, Valdivia); Milne Edwards, Ann. Sci. Nat., ser. 3, Zool., vol. 9, atlas, 1847, pl. 10, figs. 3-3e.—NICOLET in Gay, Hist. Nat. Chili, vol. 3, Crust., 1849, p. 156.

transversalis MILNE EDWARDS, Ann. Sci. Nat., ser. 3, Zool., vol. 220 [186], pl. 11, fig. 5.—MIERS, Proc. Zool. Soc. London, 1869, p. 109 (specimens from Sandy Point).—ORTMANN, Zool. Jahrb., Suppl., vol. 5, 1897, p. 329 (specimen described probably not a true *transversalis*, but a specimen from Chile).—RATHBUN, Publ. U. S. Natl. Mus., vol. 38, 1910, pp. 546 and 588, pl. 46, fig. 1 (affinity of *transversalis* to *valdiviensis*).

panamensis FAXON, Bull. Mus. Comp. Zool., vol. 24, 1892, p. 102 (specimens from Panama; type in M.C.Z.) ; Mem. Mus. Comp. Zool., vol. 30, pl. 5, figs. 1, 1a, 1b.

—Sharp ridge entirely across hinder part of carapace; chela of maxilliped much longer than penultimate segment; fingers not gaping. Extremity of male abdomen with penultimate segment semicircular.

of male.—Carapace mostly smooth and punctate; lateral angles forming a prominent shoulder; carapace narrows at the sides; a groove behind the eyes; otherwise carapace flat up to a prominent, sharp ridge

terior border convex and pu-
posterior border tuberculate;
leg very small, reaching to
merus of third.

ween second and third seg-
of abdomen there is a row of
which lie flat on the second
t; some of third to sixth seg-
usually partly fused; end of
en from middle of sixth seg-
suddenly enlarged, end seg-
emicircular.

Sexual variation.—Female larger,
more swollen, frontal region more inclined,
lateral ridges weaker, posterior margin wider,
angles more setose.

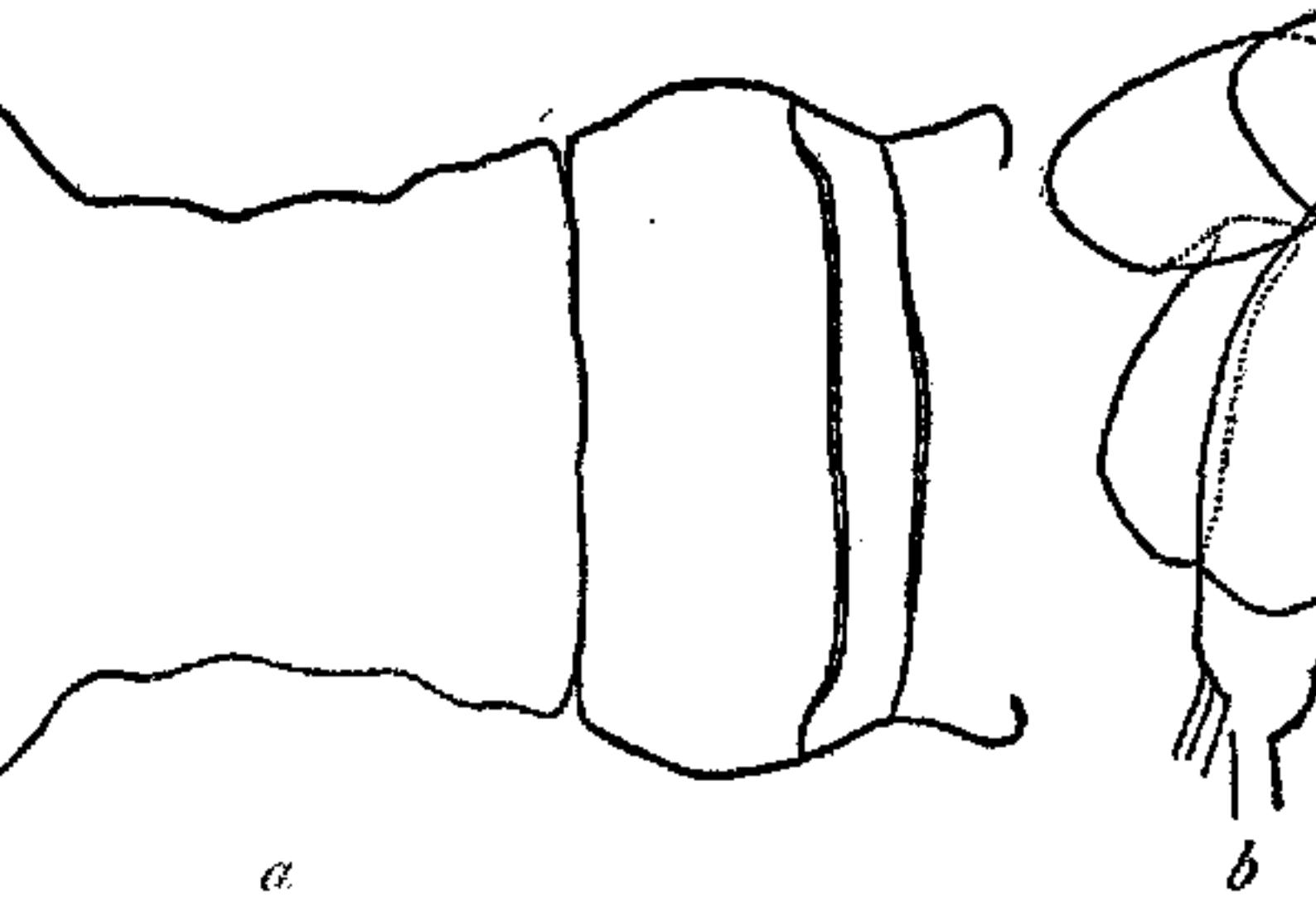
Color.—Violet; abdomen of male ash-colored, of f.
(Milne Edwards and Lucas).



FIG. 74.—PINNIX
OUTER MAXILLULA
(40446), $\times 16\frac{1}{2}$.



ty.—Trinidad; *Albatross*; male holotype; Cat.



A FAXONI (7639), $\times 13\frac{1}{2}$. a, ABDOMEN OF MALE; b, OUTER

—Blunt ridge entirely across hinder part of segment of maxilliped much longer than penning. Extremity of male abdomen much enlarged triangular.

In male.—Near *transversalis*, but much shaggier especially on posterior margin of carapace and across 1st abdominal somite and thence in a straight ridge across carapace at cardiac region not shaded. Front more horizontal and advanced. L

Trinidad.

rial examined.—Trinidad; shore; Jan. 30—
Albatross; 7 males (1 is holotype), 7 fem.
 Monos Island, Trinidad; shore; Jan. 30—
Albatross; 1 male (23436).

PINNIXA CRISTATA Rathbun.

Plate 29, figs. 8 and 9.

ixa cristata RATHBUN, Amer. Nat., vol. 34, 1900, p. 5
Beaufort, North Carolina; holotype female, Cat. No. 4

nosis.—Sharp crest across posterior part of carapace; thumb short. Legs narrow; dactyls slightly curved.

Description of female.—Carapace very short, narrow, high, sharp, transverse crest across carapace, of last legs; surface punctate, wrinkled, and mottled.



-PINNIXA CRISTATA,
MAXILLIPED OF FE-
MARE.

granulate; deep furrow b
region; antero-lateral margin
stopping short of hepatic reg
margin wide, concave. Fron
advanced; orbit no wider than

Chelipeds rather stout; pa
with upper and lower margin
face covered with a reticula

y.—San Matias Bay, Patagonia; steamer
Cat. No. 5741, M.C.Z.

—Thumb reduced to spiniform angle of propod
curved to meet thumb. Sharp ridge across pa
ce and across front.

—Carapace narrowed to an acute angle at either
end; a transverse crest across hinder part of carapace

from
the de

ver-
erior

ob-
rd to

fur-
similar

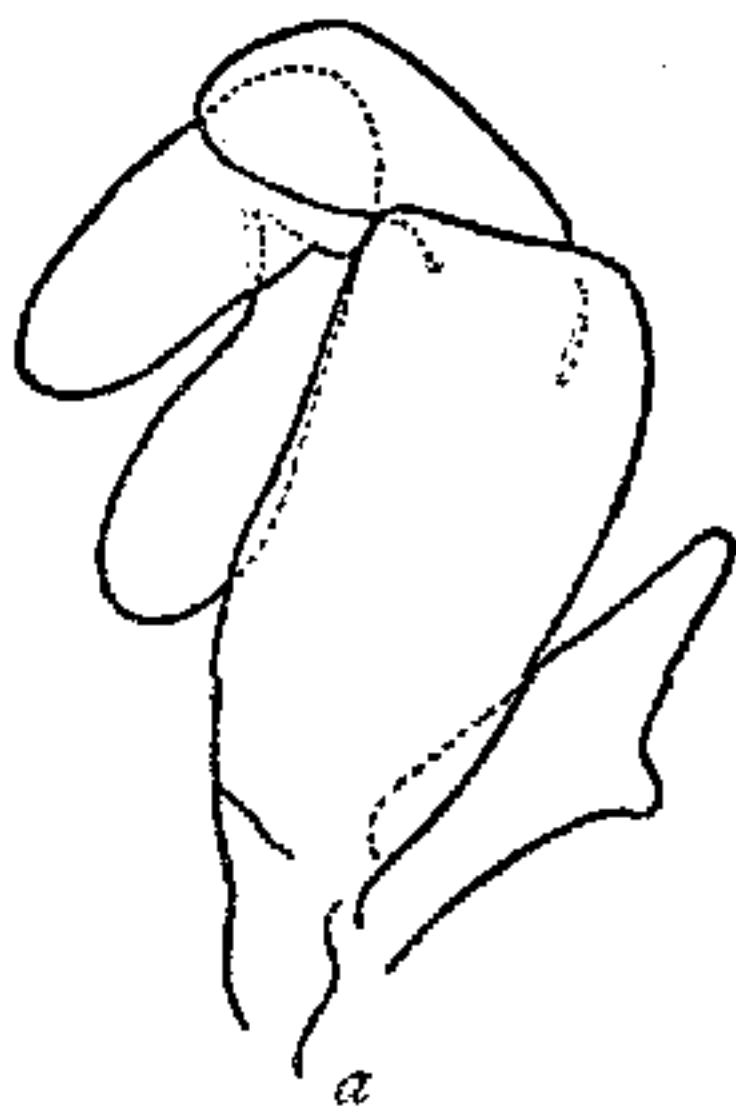
le an-
margin

sur-
ng to

f or-
short

s ob-
ward

ital region; a transverse crest across the front
the median furrow. This crest is connected with
the dorsal margin of the cheliped by a sharp



a



b

FIG. 79.—*PINNIXA PATAGONIENSIS*, MALE HOLOTYPE.
MAXILLIPED, $\times 18\frac{1}{2}$; b, ABDOMEN, $\times 7\frac{1}{2}$.

of normal shape, triangular, as long as high, about as wide, moderately curved, when closed incisive gape.

Measurements.—Male, holotype, length of carapace 2.8 mm.

Specimens examined.—San Matias Bay, eastern Panhandle; 1 male holotype, reproducing right (U.S.N.M.); 1 young, paratype (49248, U.S.N.M.).

Similarity.—Related to *P. cristata* in the sharp dorsal spine and to *P. monodactyla* in the spinelike thumb.

PINNIXA MONODACTYLA (Say).

Pinnixa monodactylum SAY, Journ. Acad. Nat. Sci. Philad., 1818, p. 454 (type-locality, America; type probably to be in "Richmond Museum").

Diagnosis.—Thumb reduced to spiniform angle of middle of lateral edge, which is rounded, a tubercle at base, a spiniform angle instead of a thumb, with another at base of dactylus larger. Dactylus oval at base, rectilinear toward tip, with an angle

Description of male.—Carapace subelliptical, narrow, middle of lateral edge, which is rounded, a tubercle at base, a spiniform angle instead of a thumb, with another at base of dactylus larger. Dactylus oval at base, rectilinear toward tip, with an angle

Carapace nearly three times as wide as longer than the others; fourth leg not reaching



LONGIPES, COTYPE, GENERAL OUTLINE, ENLARGED. (AFTER

—Carapace more than $2\frac{1}{2}$ times as wide as long above, a depression behind the gastric region just behind margin of front.

small, short, hairy; chelae ovate-oblong, distally pointed, upper margin convex, lower nearly straight, distally granulated; fingers subequal, subacute, fitting closely together, a subbasal tooth on dactylus, median tooth on thumb, and a small notch into which the point of dactylus fits.

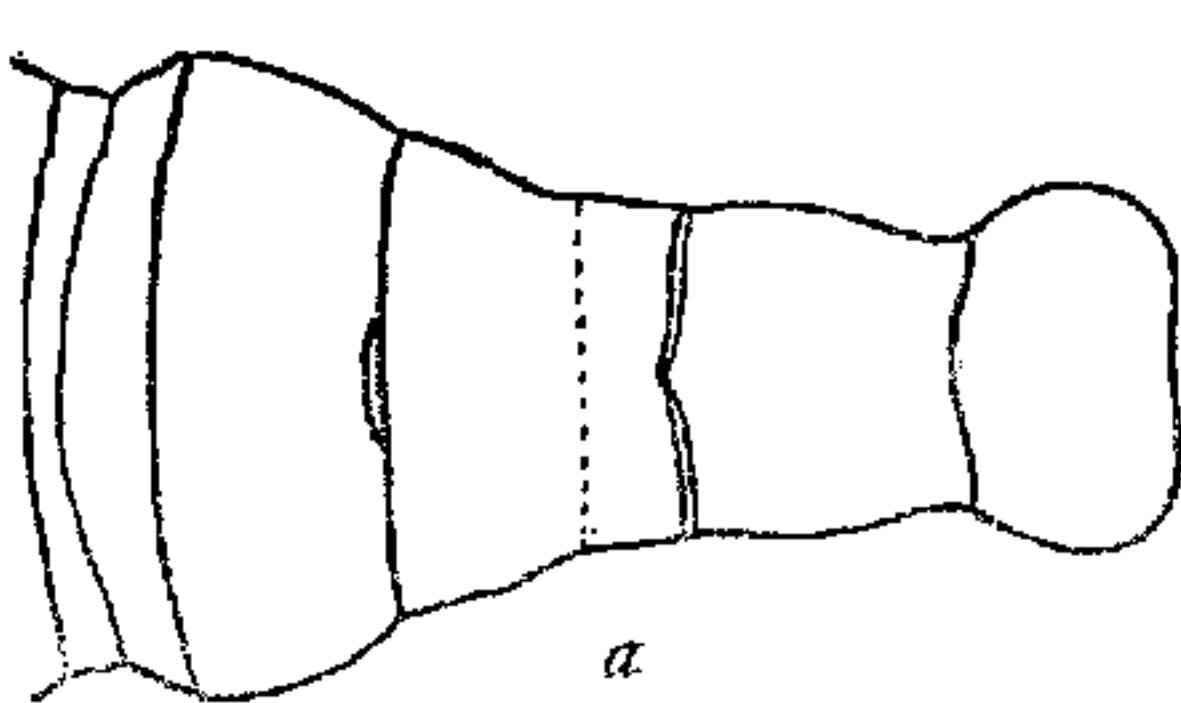
Plate 30, figs. 4-7.

nnixa cylindrica KINGSLEY, Proc. Acad. Nat. Sci. Ph
402 (part: some specimens from Sarasota Bay).

Type-locality.—Marco, Florida; Henry Hemphill
Cat. No. 6996, U. S. N. M.

agnosis.—Carapace twice or little more than t
Merus of third leg less than twice as long as
straight. Chelae weak, granulate.

Description of female.—Carapace appearing sub
lateral angle forming a sort of shoulder, the



—PINNIXA FLORIDANA. *a*, ABDOMEN OF MALE (49240) $\times 15$
PEL OF FEMALE PARATYPE (6996), $\times 10$.

apering outwardly; surface smooth and punct

rnum.

on.—In male, carapace narrower, side wall relatively more prominent; palm wider proportionally, shorter, fingers gape slightly. Abdomen wide at base, it tapers unevenly to the last segment, which is sixth, truncate at extremity, strongly arched at base, with long hair.

—Male (49249), length of carapace 2.4, width 1.6. Female (6996), length of carapace 3.5, width of

Florida at Marco and Sarasota Bay.

Mixed.—

Florida; 1885; Henry Hemphill; 3 females ovig.

Florida: Union College collection (1015); 1 female labeled *P. cylindrica* by Kingsley (49249). New York (1039); 1 female ovig., labeled *P. cylindrica* by Kingsley (49249).

PINNIXA RETINENS,¹ new species.

Plate 41, figs. 1 and 2.

—Chesapeake Bay; off Poplar Island, Maryland; sand bottom; Apr. 25, 1916; station 8528; *Fish Hawk*; Cat. No. 50167, U.S.N.M.

No cardiac ridge. Fingers slender, not deflexed

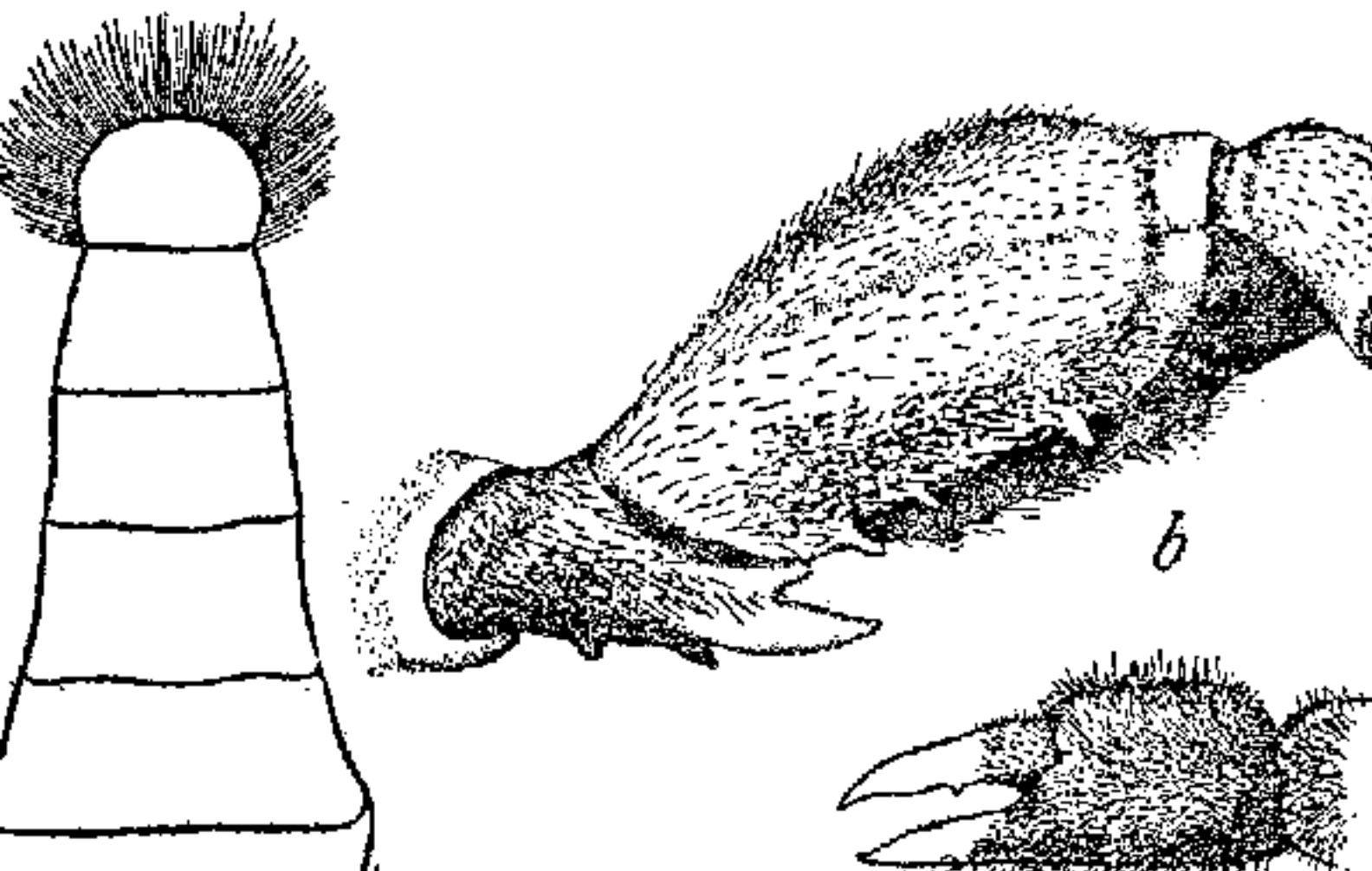


33.—*PINNIXA RETINENS*,
OGNATH OF OUTER MAX-
ILLED OF MALE HOLOTYPE.
33½.

its dactylus is stoutish, nearly straight, the tip curved.

Abdomen constricted at base of second segment and third segments, from which point it gradually

merus and propodus armed with spinules; postero-distal prolongation in a stout, curved point of which is directed backward; dactylus more than twice as long as in preceding legs, tapering to a slender point; in posterior leg, if extended, reaches the end of the median claw.



sh Hawk; 1 male holotype (50167).
ay; 20 fathoms; sft. m.; Apr. 25, 1916; station
kwk; 1 female paratype (49641).

ed to *P. floridana* in the character of the che-
a carina on the carapace. Differs in the nar-
presence of a long spine on the ischium o-

PINNIXA TOMENTOSA Lockington.

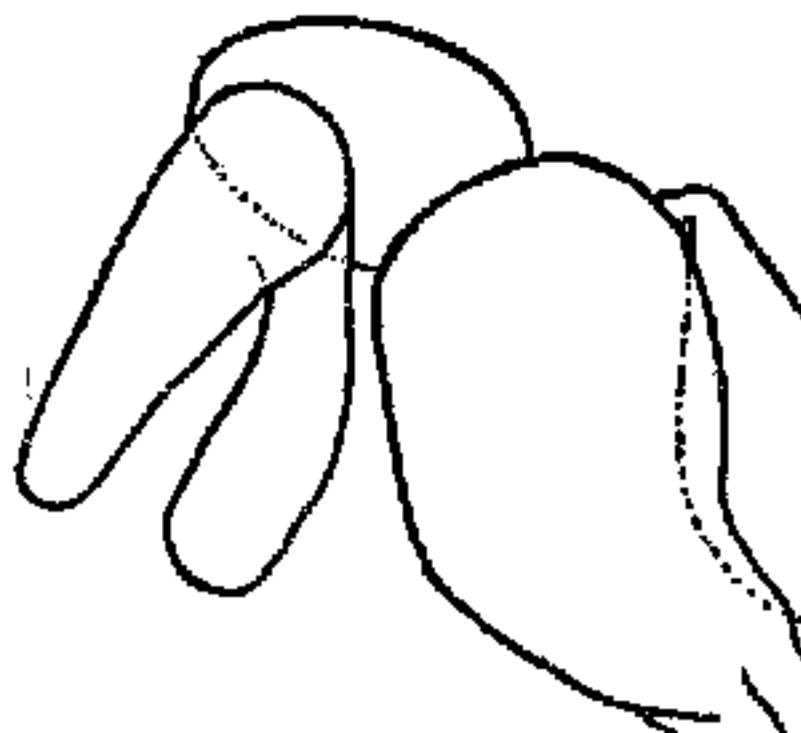
Plate 30, fig. 8.

ida LOCKINGTON, Proc. California Acad. Sci., vol. 155 [11], part (female).

tosa LOCKINGTON, Proc. California Acad. Sci., vol. 156 [12] (type-locality, Angeles Bay, Gulf of California).—HOLMES, Proc. California Acad. Sci., ser. 2, 38, pl. 20, figs. 11-13.

ropodus of last two legs nearly square, much
proximal end of dacty-
of first two legs longer,
straighter than that of

of female.—Carapace
d with a short pubes-
e nearly twice as wide
, and rounding down
hallow depression be-



ED. a, CHEMA; b, THIRD LEG; c, FIRST LEG. (AFTER
HOLMES.)

and
long;

y square; fourth leg similar in shape but much
measurements.—Female holotype, length of carapace
14 mm. (After Holmes.)

Range.—San Clemente Island, California, to Ango-
ornia.

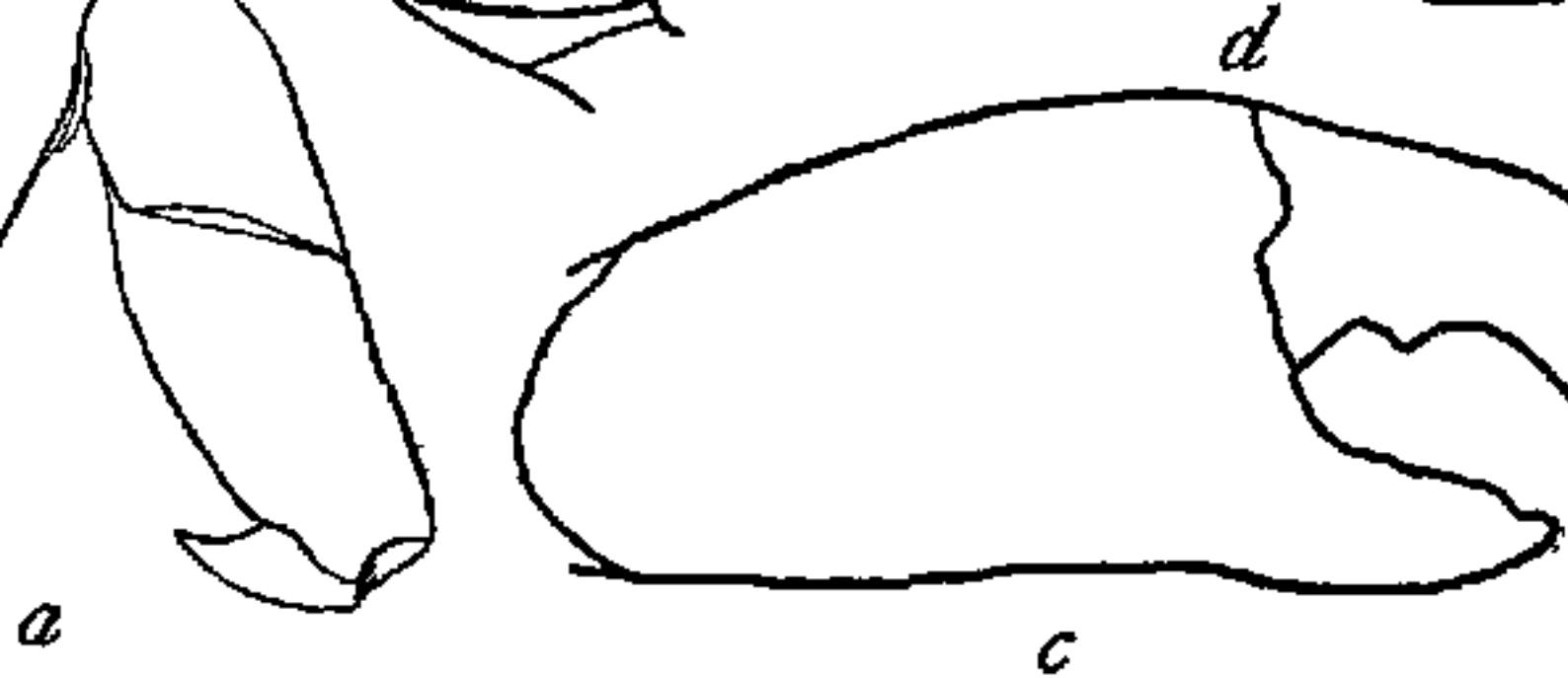
Specimen examined.—San Clemente Island, Ca-
, collector; 1 female without chelipeds (29948)

PINNIXA FABA (Dana).

Plate 31, figs. 1-4.

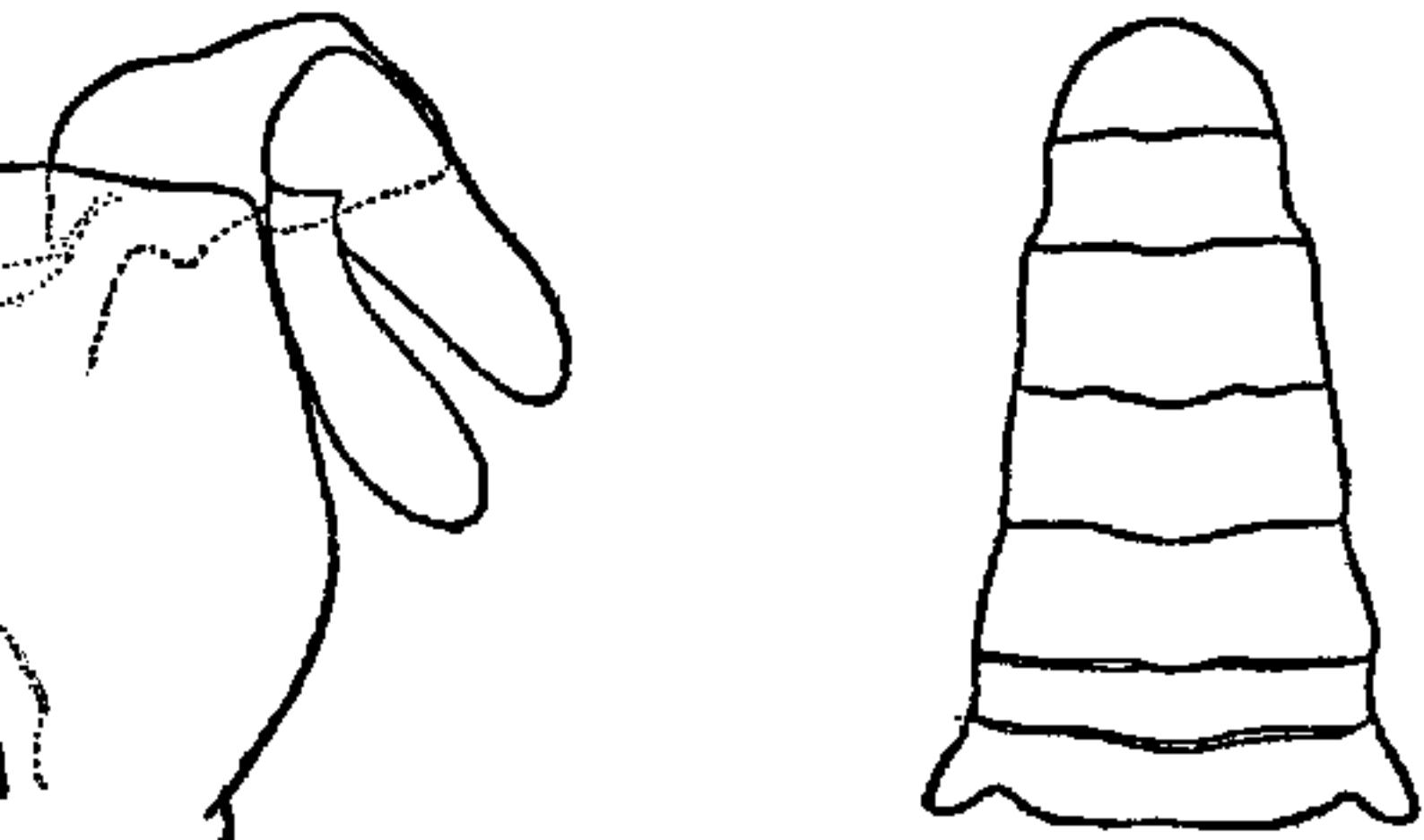
Innothera faba DANA, Proc. Acad. Nat. Sci. Philadelp.
253 [7] (type-locality, Puget Sound; type not ex-
Expedit., vol. 13, Crust., pt. 1, 1852, p. 381; atlas, 1855).
Innixa faba STIMPSON, Journ. Boston Soc. Nat. Hist.,
[30].—COOPER, Repts. Explor. & Survey, Miss. River,
12, book 2, 1860, p. 387.—NEWCOMBE, Bull. Nat. His.
lumbia, 1893, p. 25.—HOLMES, Occas. Papers Calif.
7, 1900, p. 93.—RATTIBUN, Harriman Alaska Expe-
188 (part; not from Sitka or San Pedro).—WEY-
ford Jr. Univ. Publ., Univ. ser. No. 4, 1910, p. 59
men from Monterey Bay or text-fig. 7. Probably not
well, Cat. Australian Crust., 1882, p. 113, from Port
Innotheres faba BATE in Lord's Naturalist in Vanco-
Col., vol. 2, 1866, p. 271.

Pinnixa littoralis WEYMOUTH, Leland Stanford Jr.



AREA (31599), $\times 6$. *a*, THIRD LEG OF FEMALE; *b*, THIRD LEG OF MALE; *c*, LEFT CHELA OF FEMALE; *d*, EYE IN ORBIT, FRONT V

e end upcurved, edge finely crenulate and with which the tip of the dactylus fits; dactyl curved near its base, and forming when closed a moderate; fingers hairy within and toward their base.



el; fingers longer, less deflexed, not gaping crossing; thumb without a terminal notch, but in middle of prehensile margin; edge of dactylus more alike than in male; first leg reaching top of second; fourth leg reaching beyond end of top of third leg about twice as long as wide.

Variations.—In some males the antero-lateral arms are compressed and correspondingly thin, forming a lateral

Color.—In life, grayish-white (Cooper). Specimens from Doctor Fraser are as follows: General color of body pale yellowish-white with patches of scarlet on the gastric regions. Male, orange-rufous, or dirty greenish-yellow with dark spots on carapace and a few of the same on legs. 1 female from Taylor Bay was entirely white.

Measurements.—Male (17468), length of carapace 13 mm. Female (17468), length of carapace 15.5 mm.

Habitat.—Commensal in clams and according to Holmes (17468) in the gills of a large holothurian, *Liosoma arenata* [arenaria] (Molpadiidae) and *Molpadia arenicola*. I think that Holmes's species is *Leptoclinides ornharti*.

Range.—From Prince of Wales Island, Alaska, to California. San Pedro, California (Holmes).

Material examined.—

1 ♂, Bay of Islands, New Zealand, 1 Aug., 1901.

). Snake Island; in *Schizothaerus*; May 22; (49608). Taylor Bay; in *Schizothaerus*; April; "entirely white" (49609); both hands have been broken off at the same place, a short distance from the carpus. Sound; in *Schizothaerus*; May 31; 19 males, 10 females (49610). False Narrows; in *Schizothaerus*; May 31; 19 males, 10 females ovig. (49611).

Oregon; Columbia River; in *Schizothaerus nuttallii*; Geological Survey; 1 female ovig. (40400).

Puget Sound; Dr. C. B. R. Kennerly, North Pacific Fishery Commission Survey; received from Smithsonian Institution; (1316, M. C. Z.).

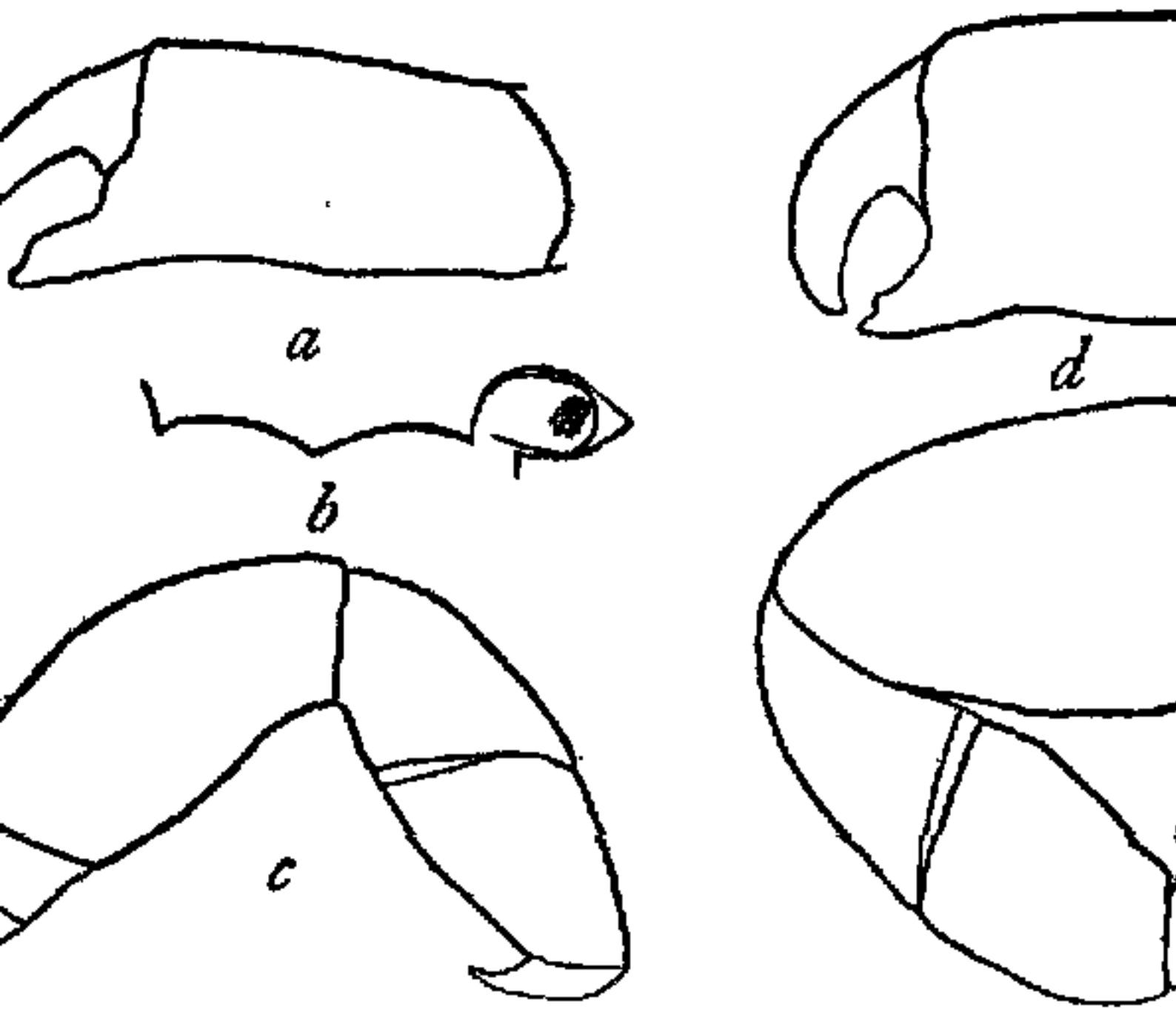
Dock, Washington; from clam; 1903; collected by steamer *Albatross*; 2 males, 4 females (3 ovig.) (3116, M. C. Z.). Victoria, British Columbia; Puget Sound, Washington; from *Schizothaerus*; 1889; O. B. Johnson; 4 males, 7 females (6116, M. C. Z.).

Puget Sound; Vashon Island, Puget Sound; from clam; 1905; steamer *Albatross*; 1 female (48430).

Washington; Seattle, Puget Sound; from clam; 1906; 2 males, 3 females (1 ovig.) (Stanford University; Oregon State Agricultural College, Corvallis).

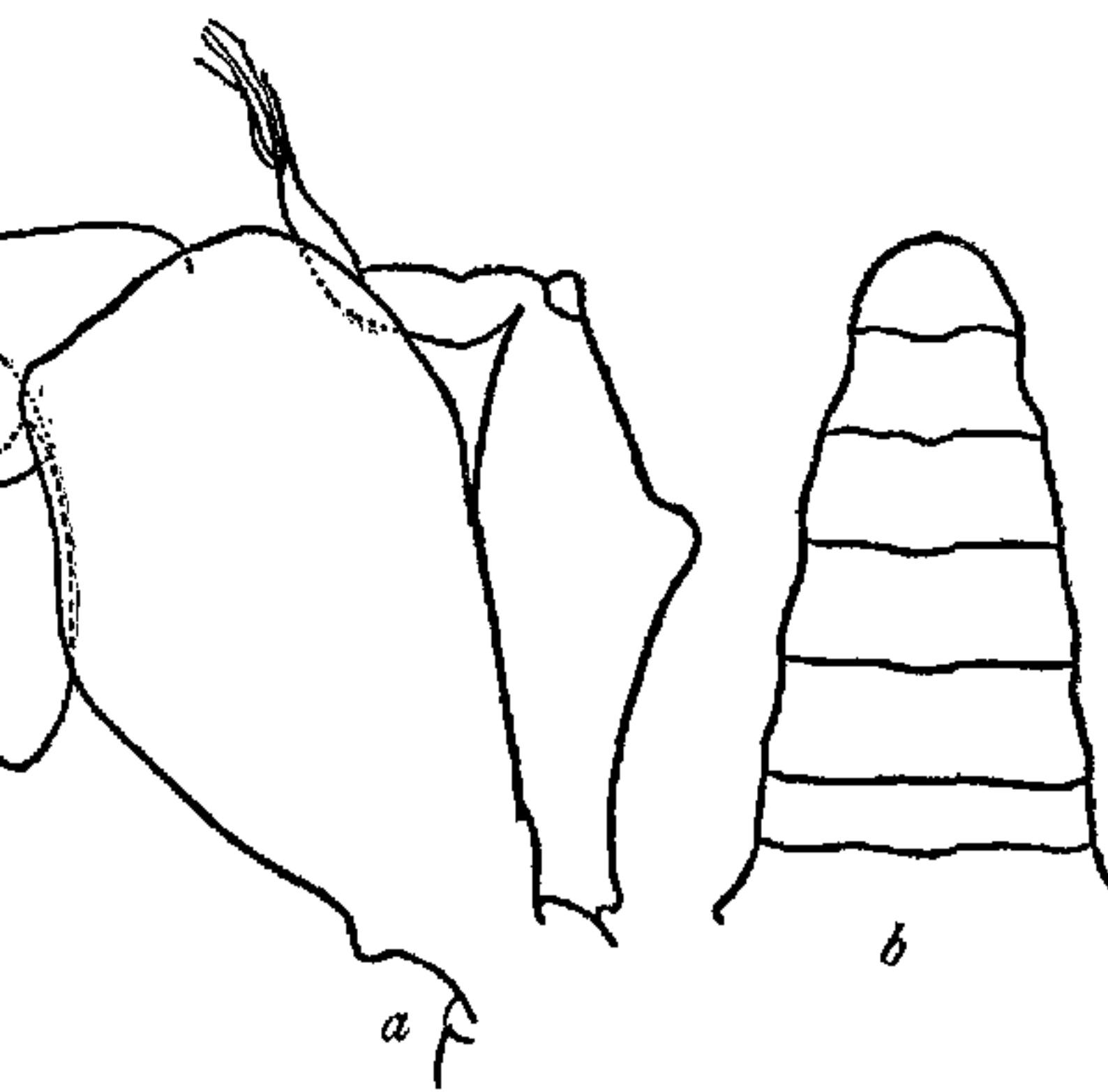
San Francisco Bay South, California; in *Tapes*; June 1, 1911; 1 male, soft shell, 1 female (Stanford Univ.).

it continued sideways beyond it and ending in male further differs from male of *faba* in haw



-PINNIXA LITTORALIS (31000), X 6. a, LEFT CHELA OF FEMALE, FRONT VIEW; c, THIRD LEG OF FEMALE; d, LEFT CHELA OF MALE.

, more deflexed, tip less upcurved, subterminal claw more strongly curved, prehensile edge entire than in *faba*; first leg reaching to distal third of second; second leg to dactyl of third; fourth overpassed leg by length of dactylus: third leg notice



LITTORALIS (31600). *a*, OUTER MAXILLIPED OF FEMALE, \times 5; *b*, ABDOMEN OF MALE, \times 5.

near the station at Departure Bay are said by yellow (in place of coral red), with a band on the legs.

Specimens.—Male (31600), length of carapace 7.4, width

Female (48427), length of carapace 16.3, width

ture Bay, British Columbia; in *Mya arenaria*; 1 female y. (39128).
; British Columbia; in *Mya arenaria*; Geolog
; 1 male, 1 female y. (40399).
nan Island, British Columbia; in clams; M
Albatross; 6 males, 12 females (5 ovig., 7 imm
n Bay, Vancouver Island, British Columbia: I
y *giganteus*; Apr. 16, 1914; steamer *Albatross*
, all young (boiled) (48433). East of coal w
steamer *Albatross*; 1 female ovig. (49255).
sh Columbia; 1916; C. McLean Fraser: Ham
arenaria; May 20; 68 males and females, all y
iological Station, Departure Bay; in *Schizotho
1 female (49613). North shore, Departure
; 16 males and females, all young (49614). Bi
zothaerus; May 18; 3 males, 2 females ovig.
(49615). Kanaka Bay; on *Mya*; May 29; 35
all young (49616). Protection Island; May 2
on *Schizothaerus* (49629); 124 males and fem
ature), in *Mya* (49617). Echo Bay, Newcastle
ales, 4 females (3 ovig.), in *Schizothaerus* (496
males (only one is mature), in *Mya* (49619).
; May 22; 32 males and females, all young (496
pr. 5; 3 males, 5 females (4 ovig.) in *Schizotho
s and females, all young, in *Mya* (49622). Tay**

48436).

a Island, California; 50 fathoms; H. N. Lowe
er shell, with very small eggs (29946).
California; H. Hemphill; 1 male (17501).

PINNIXA BARNHARTI,¹ new species.

Plate 32.

lida Streets, Bull. U. S. Nat. Mus., No. 7, 1877, p.
tumida Stimpson, 1858.

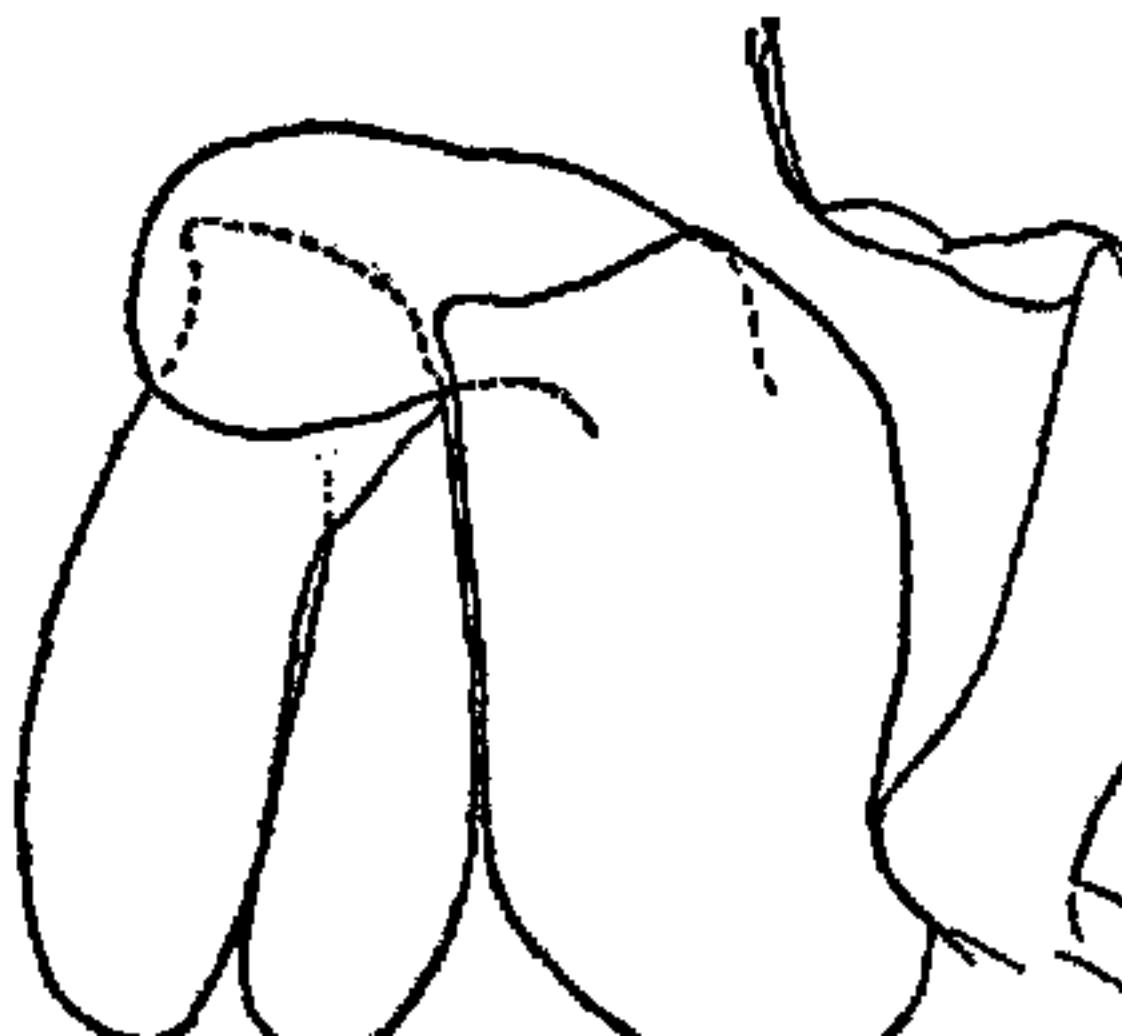
ba RATHBUN, Harriman Alaska Exped., vol. 10, 1903,
specimen from San Pedro).

ty.—Under pier at Venice, California; from e-
r; female holotype, Cat. No. 45586, U.S.N.M.

—Carapace convex, truncate at sides. Dactyl:

ight. Cheli-
ngers widely
mb strap-

of female.—
agonal, very
h directions,
e, antero-lat-
line of very
s not con-
patie region,
vertical, sub-



ick, first nearly as long as second, but narrower than tibia; metacarpus thick, first nearly as long as second, but narrower than tibia; phalangium of third, fourth to middle of carpus of fourth leg; 3 legs convex above, propodus of all tapering, straight, broad at base, acuminate.

Variations.—Chela of male very like that of female, but palm shorter; in small but mature female, palm still shorter.

Color.—The carapace in alcohol is largely a bluish green, with markings of same color on chelipeds and first three legs.

Measurements.—Female holotype, length of carapace 16.2 mm. Male (M. C. Z.), length of carapace 15.5 mm.

Habitat.—Commensal with holothurians.

Type locality.—Venice, California, to Ballenas Bay, Lower California.

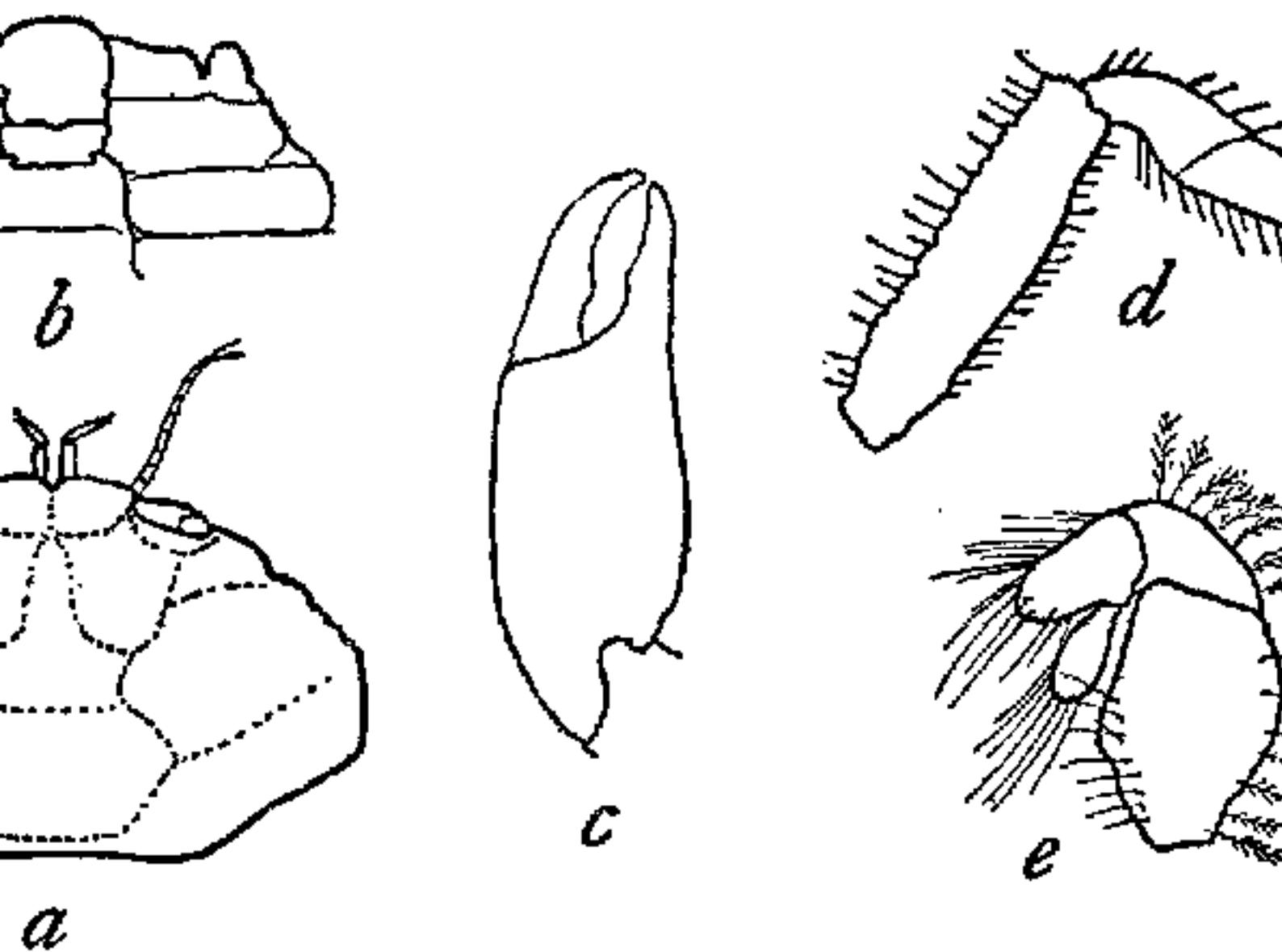
MATERIAL examined.—1 ♂, from under pier at Venice, California; from cloaca of a holothurian, Mayaguez Harbor, Puerto Rico; 1 ♂, from cloaca of a holothurian, San Pedro, California; 1901; T. D. A. Cockerell; 1 ♀, from cloaca of a holothurian, San Diego, California; from cloaca of *Liosoma arenicola* (now *Molpadia arenicola*); H. Hemphill; 1 ♂, 1 ♀, from cloaca of a holothurian, San Diego, California; 1 male, 1 female (5742, M. C. Z.).

PINNIXA MINUTA Rathbun.

Pinnixa minuta RATHBUN, Bull. U. S. Fish Comm., vol. 22 (1901), p. 21, text-fig. 4 (type-locality, Mayaguez Harbor, Puerto Rico). Holotype, Cat. No. 23768, U.S.N.M.).

Legs pubescent.

nts.—Male holotype, length of carapace 1.3,



A. MINUTA, MALE HOLOTYPE. *a*, CARAPACE, ANTENNAE AND EYES, ABDOMINAL SEGMENTS AND ADJACENT STERNUM, $\times 18$; *c*, RIGHT LEG, $\times 18$; *e*, ENDOGNATH OF OUTER MAXILLIPED, MUCH ENLARGED.

Porto Rico: Mayaguez Harbor, Point del Algarrobo 17 fathoms; M. S.; temp. 23° C.; Jan. 20, 1901. Amer *Fish Hawk*; 1 male holotype (23768).

PINNIXA CHAETOPTERANA Stimpson.

3.—PINNIXA
TOPPERANA,
RDS BAY. *a*,
OF ADULT
b, X 6; *b*,
OR ADULT
X 4. (AFTER
.)

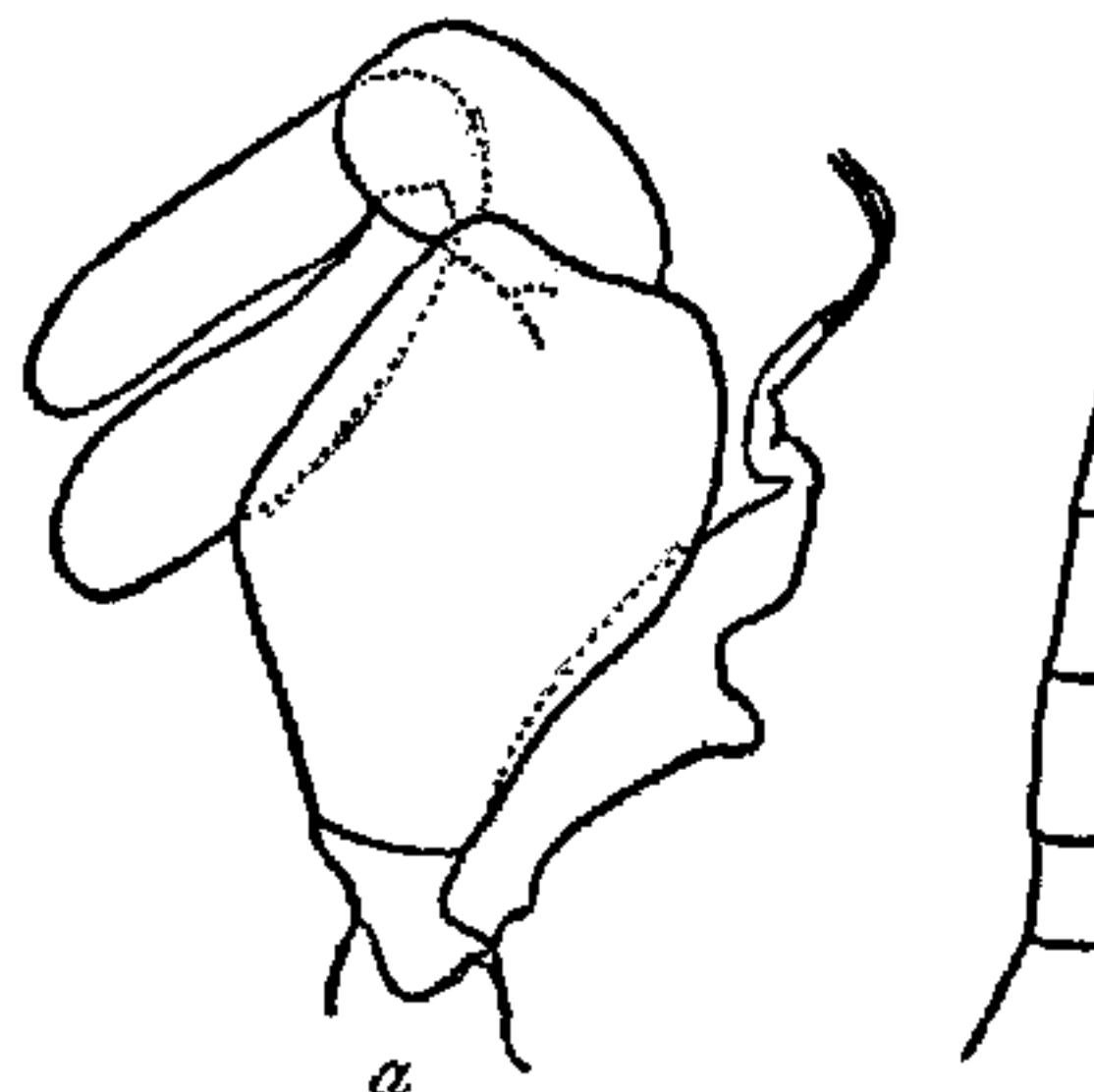
region a short sharp ridge arched
granules on antero-lateral margin
advanced, truncate.

Chelipeds strong, smooth; palm
convex on margins except near base
which is very short, much deflexed,
lar, prehensile tooth near its base and an oblique
. tip; dactylus strongly curved, almost vertical
gape when closed.

tibialia of first two legs slender and slightly curved
and nearly straight; first and second legs slender
size, second reaching to end of propodus of third
about twice as

wide, nearly
t above, dis-
arrowed, pos-
margin, as
that of pro-
s, spinulous;
leg of similar
reaching to
of carpus of

segment of
n constricted



N. Edwards; 24 males, 17 females (5824). D.; V. N. Edwards; 1 male, 2 females (14455).
les (19085). Mar. 28, 1888; V. N. Edwards; 1
). Aug. 12, 1882; 1 female ovig. (31482). Aug.
6).

land, Massachusetts; U. S. Fish Comm.: In
zaceus; 1882; 1 male, soft shell (34168). Shor-
ale, 1 female, with *Vesicularia* attached (38293).
ale (40798). Aug. 10, 1882; 4 males, 1 fema-

ound, Massachusetts; U. S. Fish Comm.: In
zaceus; 1885; V. N. Edwards; 3 males, 4 fema-
g. 1, 1886; 1 female ovig. (48434).

assachusetts; 3-5 fathoms; Sept. 3, 1882; U.
les (34188).

ay, Massachusetts; U. S. Fish Comm.: 8½ f-
36° F.; Aug. 26, 1881; station 963; steamer *Fish*
. (34057). 1875; 3 males, 2 females (35308)
o north end of Woods Hole; 5-7 fathoms; bl-
-° F.; Aug. 15, 1887; stations 1211-1221; steam-
es, 5 females (12794).

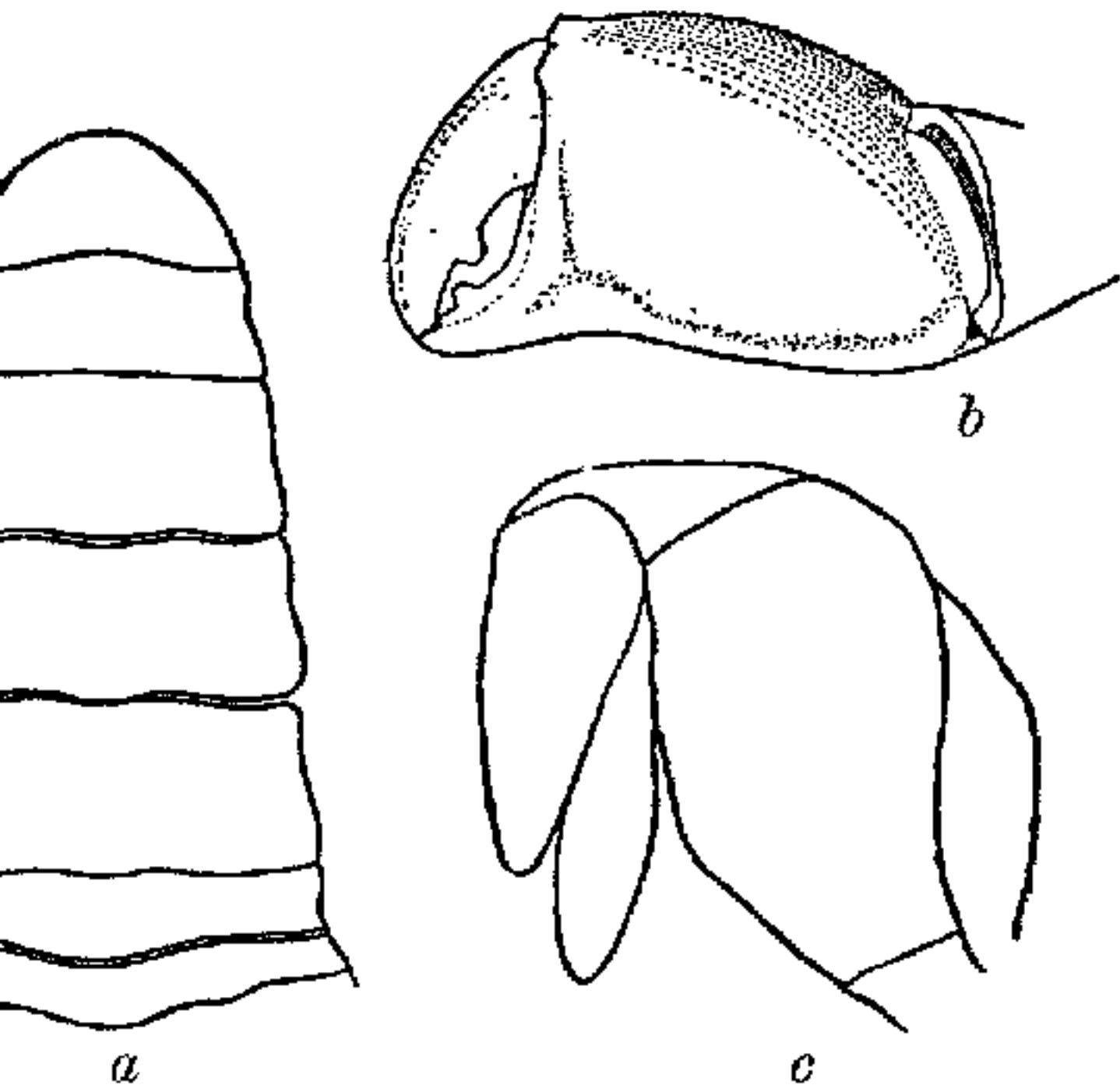
North Carolina; in tubes of *Chaetopterus*; J.
Andrews; 1 male, 1 female (18289).

nd, South Carolina; 2½ fathoms; stky.; temp.
station 1651; steamer *Fish Hawk*; 1 female

a. Florida; 1 fathom; Feb. 1884; II. Harki-

nosis.—Two short cardiac ridges in male. Tra
Dactyli of legs 1 and 2 curved, of 3 and 4 str
.. Thumb of male short, deflexed.

Description of male.—Regions faintly indicated, cov
granules and scattered punctae, cardiac region



—*PINNIXA VALDIVIENSIS*. *a*, ABDOMEN OF MALE (5740),
b, LEFT CHELA OF MALE (5740), $\times 5$; *c*, OUTER MAXIL
OF COTYPE, MUCH ENLARGED.

above lower margin, two teeth on prehensile

s. Hist. Nat. Valparaiso; 2 male cotypes in U.

or, Smith Channel, Straits of Magellan; e (5740, M. C. Z.).

PINNIXA OCCIDENTALIS Rathbun.

Plate 34, fig. 1.

Dentalis RATHBUN, Proc. U. S. Nat. Mus., vol. 16, 1898, p. 103; locality, S. of Unimak Island, Alaska, 61 fathoms; type (No. 74, U.S.N.M.), except specimen from San Diego; Benth. Expd., vol. 10, 1904, p. 187, pl. 7, fig. 4; pl. 9, fig. 1 (specimens from Cape Fox).—HOLMES, Occas. Pap. Acad. Sci., vol. 7, 1900, p. 89.

californiensis RATHBUN, Proc. U. S. Nat. Mus., vol. 16,
type-locality, Monterey Bay, California, 37 fathoms; t.
58, U.S.N.M.) ; vol. 21, 1898, p. 605; Harriman Alaska
1904, p. 187, pl. 7, fig. 3.—HOLMES, Oceas. Papers C.
hi., vol. 7, 1900, p. 90.—WEYMOUTH, Leland Stanford
Univ. ser. No. 4, 1910, p. 56 (part; not young fem.
Grove).

-Cardiac ridge biarcuate. Thumb deflexed.
rm. Merus of third leg narrow, from $2\frac{1}{2}$ to 3
e.

of male.—Setose. Carapace laterally narrow hepatic and gastric regions well marked; on the te, transverse crest which curves and backward in the middle.

stricted
Varia
ridge blu
than in
able fing
leg shor
about 2½

b

a

—*PINNIXA OCCIDENTALIS*, MALE HOLOTYPE. *a*, AS WID
OMEN, $\times 5\frac{1}{2}$; *b*, OUTER MAXILLIPED, $\times 13\frac{1}{2}$. Vary in

length to width of carapace, in the prominence of
direction of the margins of the second abdominal
in the length of the immovable finger of the ma
urements.—Male holotype, length of carapace
of third leg 27 mm. Female paratype (17474),
0.5, width 20.5, length of third leg, about 24 mm.
Habitat.—Commensal in burrows of the Gephy
lid).

ge.—From Iliuliuk Harbor, Unalaska, to M
California; 10 to 238 fathoms.

Material examined.—See page 157.

PINNIXA SAYANA Stimpson.

Plate 34, figs. 2-4.

Pinnixa sayana STIMPSON, Ann. Lyc. Nat. Hist. New York,
236 [108] (type-locality, off mouth of Beaufort Harb
one sandy mud; type not extant). KINGSLY, Pro

3 A male is type of callifor

TYPE OF OCCIDENTALIS.

middle of carpus of third; merus of third leg
as long as lower as that dus mi late; two l curved straight edge of last leg terior Abdomen chiefly

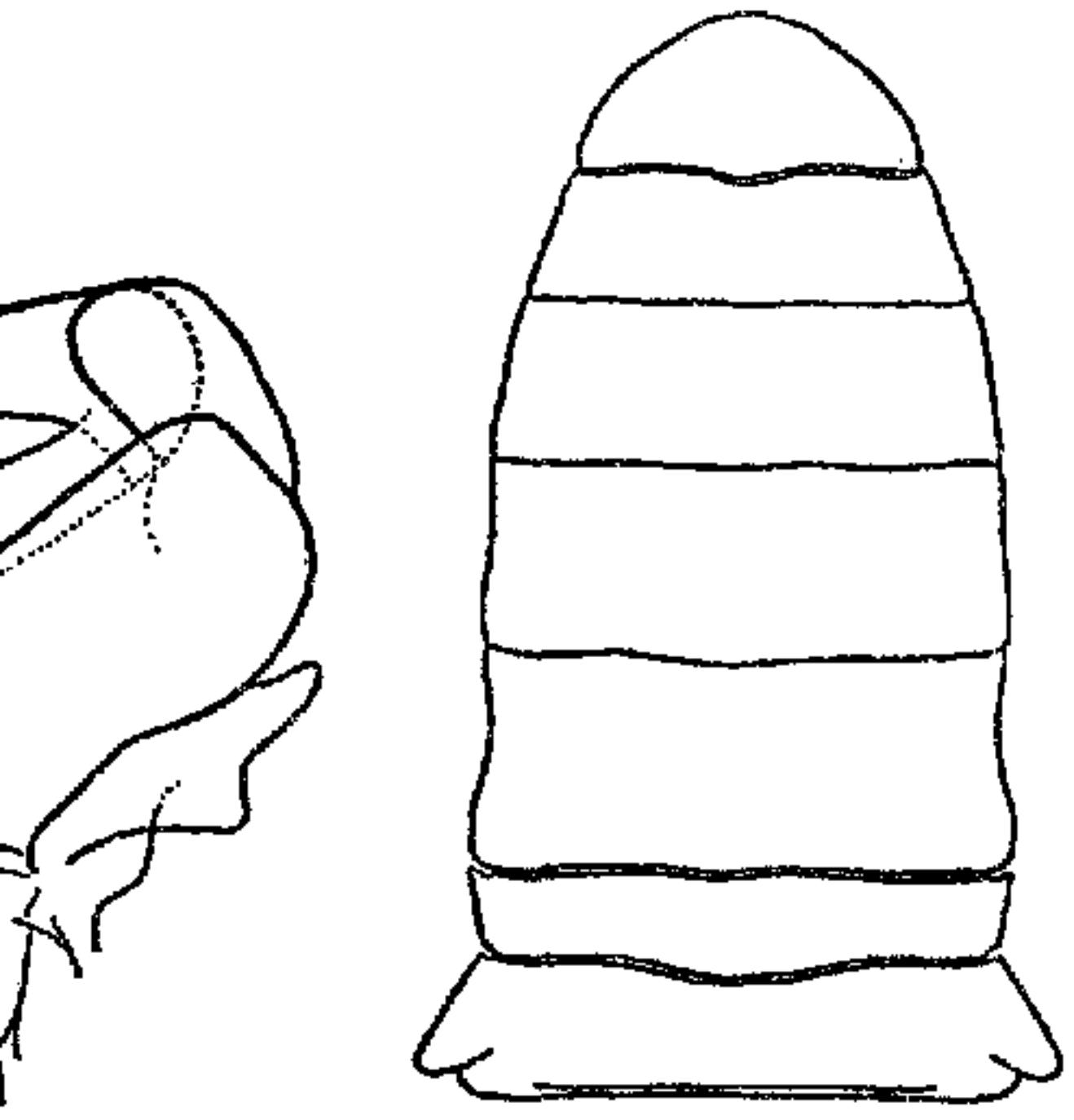
Sex. Card raised in female. gaping

flexed, acutely pointed, widened at middle; dac in male.

r.—A rather fresh specimen is covered with ve s, denser above than below.

Measurements.—Male (18211), length of carapace

17 mm. Female (18806), length of carapace



PINNIXA SAYANA, MALE (18211). *a*, OUTER MAXILLA, $\times 20$; *b*, ABDOMEN, $\times 11\frac{1}{2}$.

s, 2 females ovig. (36323). 10½ fathoms.; S. Aug. 6, 1880; station 774; steamer *Fish Hawk*; 120 fathoms; fne. sdy. M.; temp. 60° F.; A 303; steamer *Fish Hawk*; 3 males, 2 female fathoms; sdy. M. brk. Sh.; temp. 63° F.; A 846; steamer *Fish Hawk*; 1 male, 1 female bows; 1880; 2 males (34003).

Sound: Branford Beacon, Connecticut, N.N. fathoms; sft.; temp. 70° F.; Sept. 17, 1892; station *Hawk*; 2 males (18211).

Bay: off Barren Island, Maryland; 26 fathoms; Apr. 25, 1916; station 8523, *Fish Hawk*; 2

Bay: off Cove Point Light, Maryland; 4 fathoms; 59° F.; Apr. 25, 1916; station 8524, *Fish Hawk*.

Florida; Union College collection; 1 male (

PINNIXA CYLINDRICA (Say).

Plate 35, figs. 5 and 8.

cylindricum SAY, Journ. Acad. Nat. Sci. Philadelphia, 452 (type-locality, Jekyll Island, Georgia; cotype DE KAY, New York Fauna, Crust., vol. G, 1844, p. 13. *cylindrica* WHITE, List Crust. Brit. Mus., 1847, p. 33; A. H. STIMPSON, Cat. Amer. Crust., vol. 18, 1846, p. 177.—STIMPSON, Ann. Lyc. Nat. Hist., 1860, p. 235.—VERRILL, Rept. U. S. Fish Commr.

; a gape; a sharp, finely milled crest runs from

ard and upward, about two-fifths length of pa

dac

dle

edg

lex

mid

The

str

mai

one

rior

con

Fir

rea

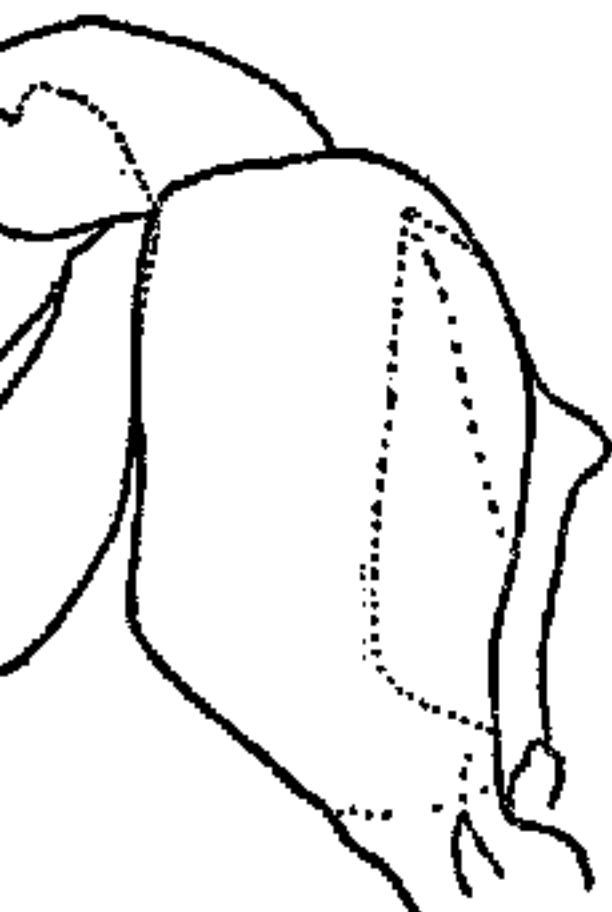
of

sec

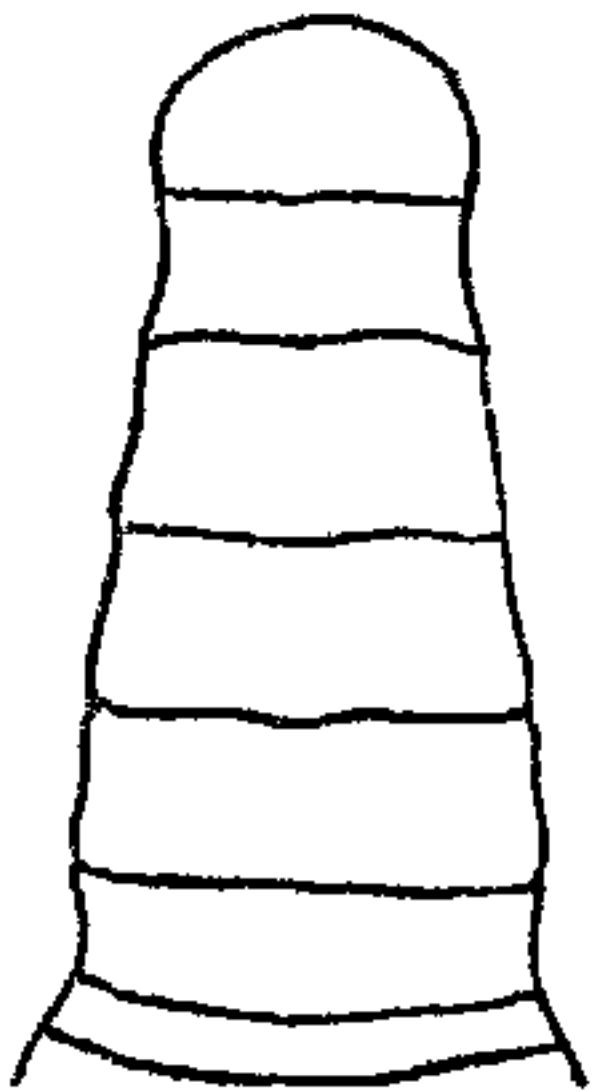
stou

—*PINNIXA CYLINDRICA*, MALE (17952). *a*, OUTER MAX-

ILLIFIED, $\times 19$; *b*, ABDOMEN, $\times 72$.



a



b

stylus of third; third very stout, merus $1\frac{2}{3}$ times

distally narrowed, upper and lower margins finely

leg very short, reaching beyond merus of third

stylus.

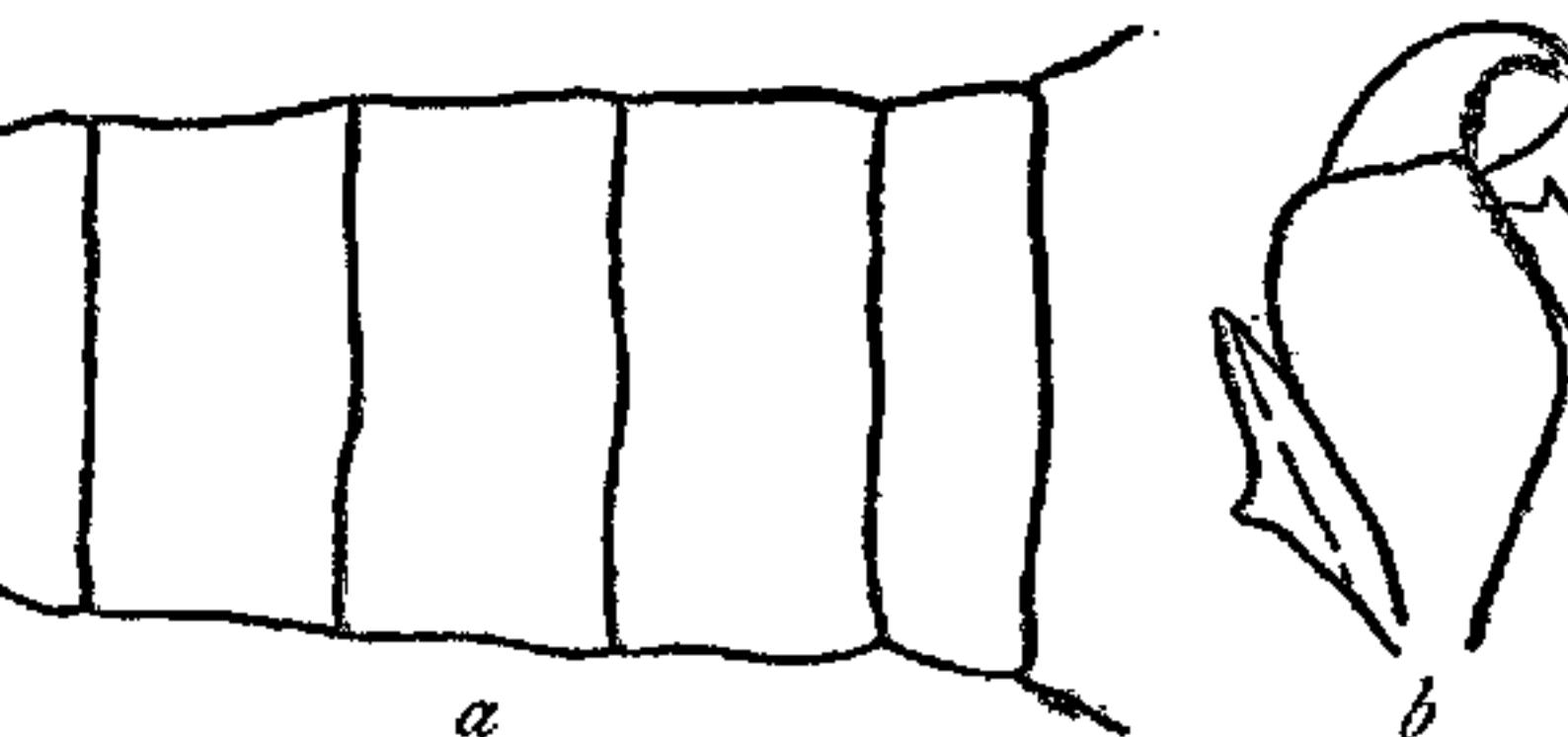
Color.—Yellowish grey (Stimpson).

Measurements.—Male (17952), length of carapace

1.8 mm. Female (49126), length of carapace

y.—Middle part of San Francisco Bay, California; station 5709, *Albatross*; female holotype, 6 M.

—Granulate ridge near lower edge of propodus horizontal. Merus of third leg wide. Late.



A FRANCISCANA. a, ABDOMEN OF MALE (48445), $\times 13\frac{1}{2}$; b, CHELIPED OF FEMALE HOLOTYPE, $\times 13\frac{1}{2}$.

of female holotype.—Near *occidentalis*, but cardiac ridge blunt and straight. Propodus of edge convex, densely granulate, lower margin from wrist to end of finger; outer surface with a groove lower edge, continued to end of finger and hair, also a line of granules through the middle of dactylae and hairs on upper half. Fingers wide, not with a wide triangular tooth at middle of dactylus, a

Albatross
do.
do.
do.
do.
do.
do.

5715
5709
5743
5772 A
5824 B
5825
5723

13. 20
13. 05
13. 26
12. 01
13. 05
12. 89
12. 85
12. 12

fne. gy. dk. s.
muddy s.
fne. muddy s.
sft. M.
shelly, muddy s.
very muddy s.
bk. M.

92-133
82-10
124-153
116-141
117-128
117-128

Alaska Exped., vol. 10, 1
specimens from Cape Fo

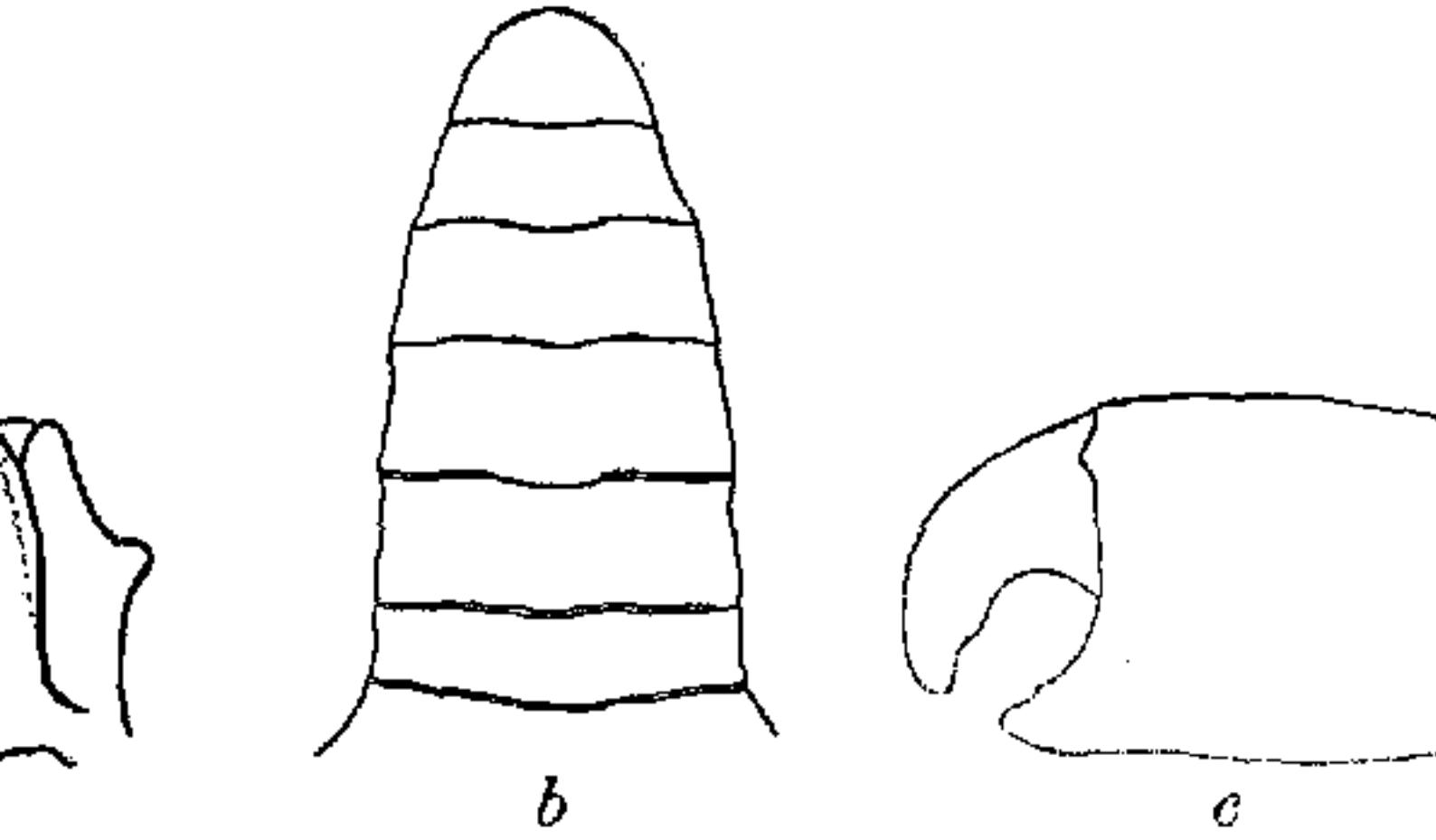
Type-locality.—Lower
Bay, California; 9½ to 11 f
5723; *Albatross*; female hol
48441, U.S.N.M.

Diagnosis.—Palm stout, wi
gins. Thumb horizontal, le
short in typical male. D
nearly straight. Upper m
joints moderately curved.

Description of female *H*
franciscana, but carapace m
sides are less pointed and
marginate crest is more pr
diac ridge obsolescent, broad
rounded; from a point be
tremity, a smooth ridge cur
the anterior branchial angle,
tally. Palm swollen, upper e
gins convex, the latter bec
concave under base of finger,
clines upward distally; out
surfaces granulate, granule
middle, forming a line nea

the general shape, I am disposed to think that the
below are all of one species; (2) in the length and
granulate, antero-lateral ridge; (3) in the inner
surface of the carapace.

ts.—Female holotype, length of carapace 5, width of third leg about 9.7 mm. Male (25850)



A SCHMITTI, MALE (25850). *a*, OUTER MAXILLIPED, $\times 15\frac{1}{2}$; *b*, CHELA, $\times 15\frac{1}{2}$; *c*, LEFT OR LARGER CHELA, $\times 7$.

width of same 9.2, length of third leg about 10 mm. Port Levashoff, Alaska, to San Francisco Bay, California.

Examined.—Port Levashoff, Unalaska, Alaska; 1 female (25850); W. H. Dall; 1 male (48440). Left chela with fingers slightly gaping, right chela with fingers gaping, both palms granulate.

ers; temp. 12.85° C.; Mar. 6, 1912; station 572
the holotype (48441). With long thumbs, non-ga-
late palms.

PINNIXA HIATUS, new species.

Plate 36, figs. 1-4.

e-locality.—Off Catalina Island, California; 50

1 female holotype (Cat. No. 29949, U.S.N.M.)

agnosis.—Dactyli of legs styliform. Fingers ga-
shorter, subtruncate at tip; a ridge near outer

Posterior margin of carapace long.

Description of female.—Carapace very wide, na-

-lateral margin arcuate without a definite angle;

a raised and finely granulate edge in
region; posterior margin very long, front ad-
front advanced, widely emarginate in
view. Surface smooth, sparingly
groove behind gastric region. Sub-
prominent. Orbita oval, filled by

Palm suboblong, upper margin
margin of palm and thumb sin-
ulated ridge on distal half just ab-

A corresponding ridge on da-

ctylus and curving up toward
ely notched by means of a tuberculiform
d. a tooth just behind middle; a wide crane w-

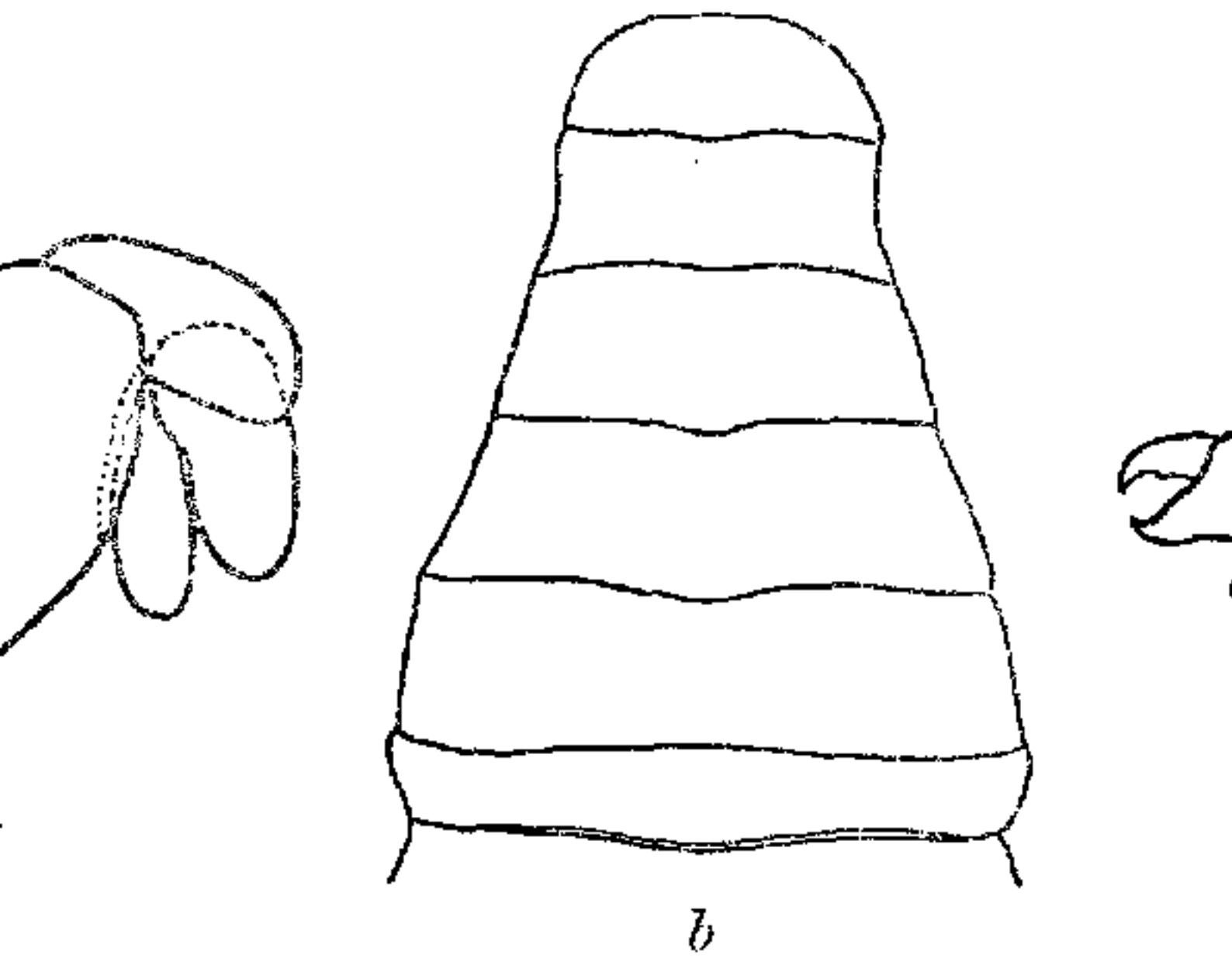


2.—PINNIXA
S., OUTER MAXIL-
OF FEMALE HOLO-
TYPE.
X 198.

r. No. 4, 1910, pl. 57, text-fig. 4.

ripes WEXMOUTH, Leland Stanford Jr. Univ. Publ., U.S.A., Vol. 10, p. 58 (part: two young specimens).

Carapace $2\frac{1}{2}$ times as broad as long in female, twice as long as broad in male. Propodus of third leg wider at distal than at proximal joint. Chelae smooth, fingers hooked.



A. TUBICOLA. a, OUTER MAXILLIPED OF FEMALE (20860), $\times 20$, AFTER WEYMOUTH, FROM TRINIDAD, $\times 15\frac{1}{2}$; c, LEFT CHELA OF MALE, $\times 6$, AFTER WEYMOUTH.

of female.—Carapace very wide, subcylindrical, tapering slightly on all sides toward the margins. Gastro-pleural fold low. No cardiac ridge, only a smoothly rounded

first 3 segments than the sternum on either side from base of third to middle of sixth segment than long, evenly rounded.

Measurements.—Female (20860), length of carapace 10, length of third leg about 10 mm. Male (Tr. space 3.2, width of same 6.8 mm.

Habitat.—Usually found commensal in leathery tubes.

Type.—Puget Sound to San Diego, California.

Material examined.—

Puget Sound; 1907; 1 male (Stanford Univ.).

Bay Harbor, Washington; July 1, 1916; Evelyn of *Amphitrite*; 4 females (49952).

San Simeon, California; June 2, 1896; S. J. Holmes,

vigorous, from calcareous tube of worm, cotype.

San Simeon, California; June 27, 1911; W. F. Thompson (3 ovig.) (Stanford Univ.).

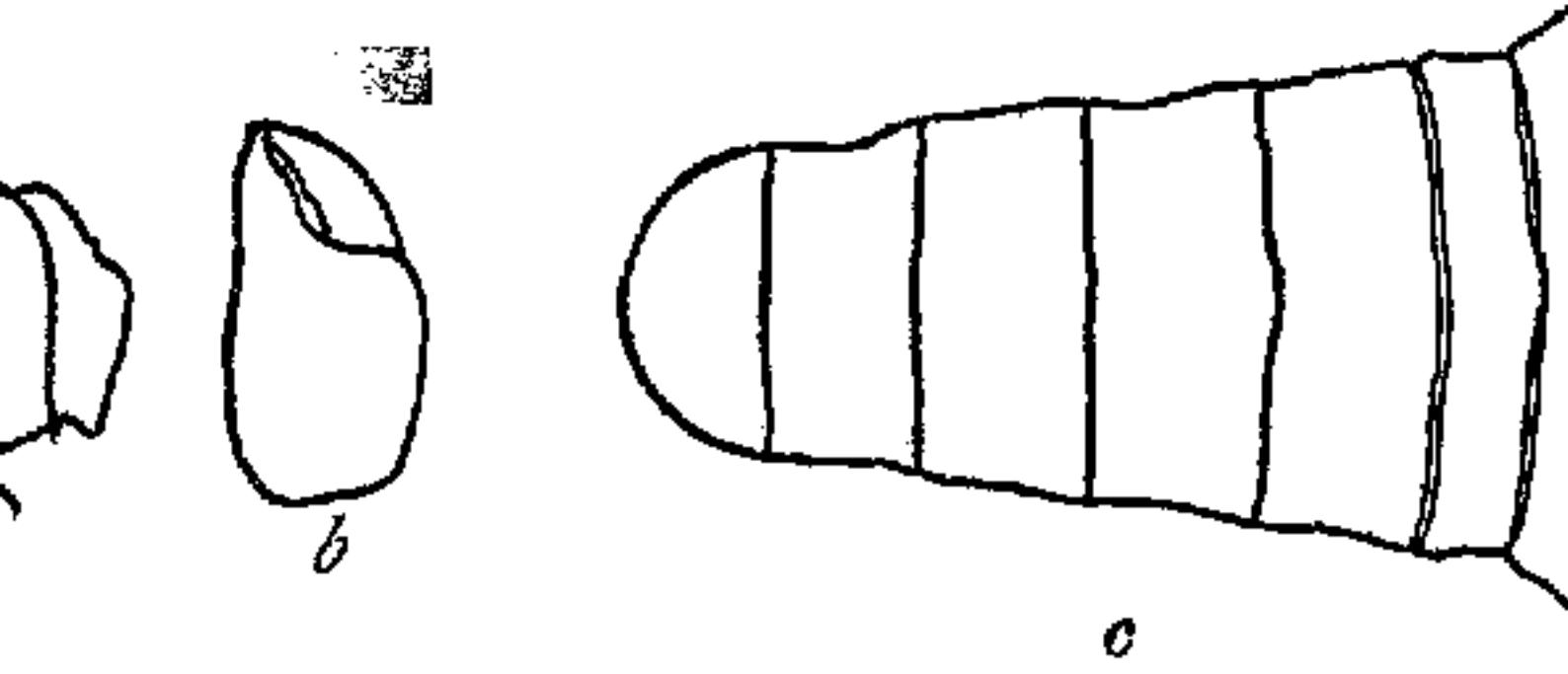
Locino, California; A. Agassiz; 1 female (U. S. Z.).

Tropic Grove, California; 2 females y. (Stanford Univ.).

Point Conception, California; lat. $34^{\circ} 25' 25''$ N. W.; 31 fathoms; gy. S. brk. Sh.; Jan. 8, 1889

U. S. Albatross; 1 female (24752).

y straight; second leg wider, but similar, reaching middle of third leg; third leg wide, dactylus slightly similar but smaller, reaching middle of carpus of fourth leg; with first segment very wide at base, its sides becoming gradually narrower from second to sixth segment, which is widest at middle; seventh short, margin broadly rounded.



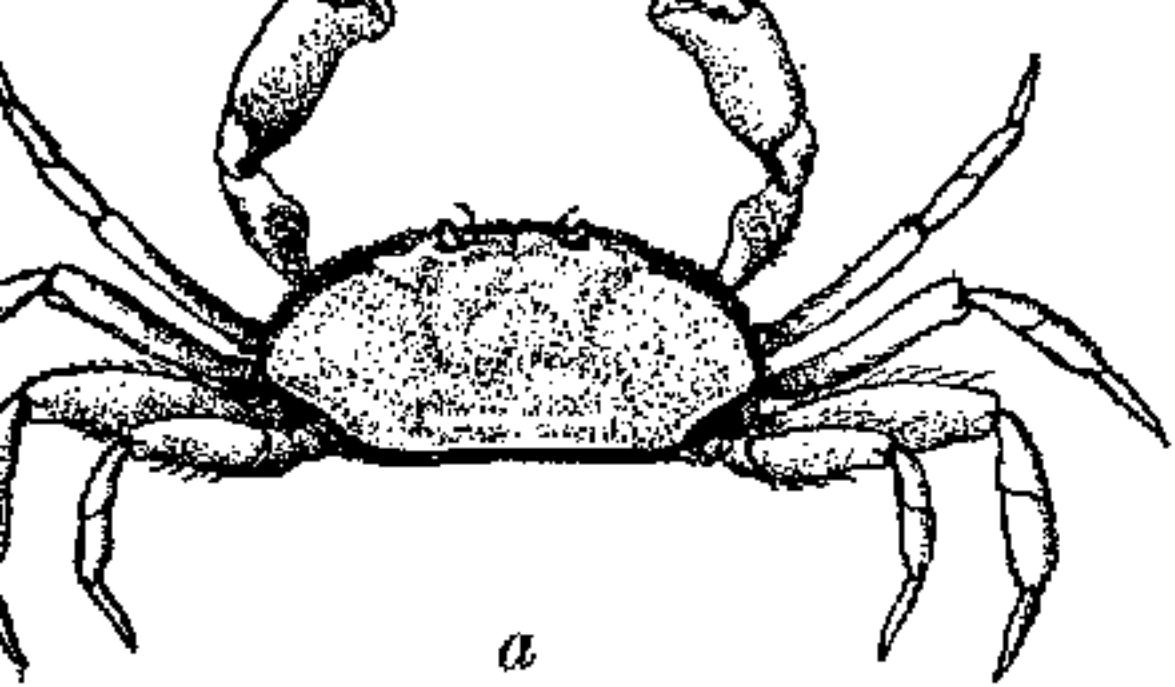
A. WEYMOUTHII, MALE HOLOTYPE. *a*, OUTER MAXILLIPED, $\times 26$; *b*, CHELA, $\times 7\frac{1}{2}$, AFTER WEYMOUTH; *c*, ABDOMEN, $\times 16$.

of female.—The female referred here is about the same size as the male but has a thin shell, so that its shape is more elongate; it is not less advanced and antero-lateral margin less produced than in male. Chelae not pubescent outside, similar in structure to those of male, except that the thumb is a little shorter. Legs slender.

Types.—Male holotype, length of carapace 3.3, width

Monterey Bay, California. Beach to 5 fathoms.

Examined.—Monteay Bay, California, off Monterey



a

PINNIXA AFFINIS, FEMALE HOLOTYPE. *a*, DORSAL VIEW, \times 10.
OF OUTER MAXILLIFIED, \times 22½.

ossed by a blunt, transverse, bilobed crest; sub-
the largest on branchial regions. Antero-lateral
region a granulate line. Front not advanced
atic region. Third joint of palp of outer maxilla
near proximal end of inner side of second.

Chelipeds smooth, pubescent; lower margin of palm
use of pollex, which is short, very broad, defle-

edge irregularly dentate, ter-
short, acute spine; dactylus
tooth at basal third; finger
when closed.

First two legs slender, me-
podal joints subparallel; first
of propodus of second; sec-
propodus of third. Third
merus very hairy along mar-



PINNIXA AFFINIS,
CHELA OF FEMALE
HOLOTYPE, \times 13.

lited in male by two triangular tubercles con-

backward, subacute; in female, crest lower, b-

dle by a very shallow sinus. Frontal and he-

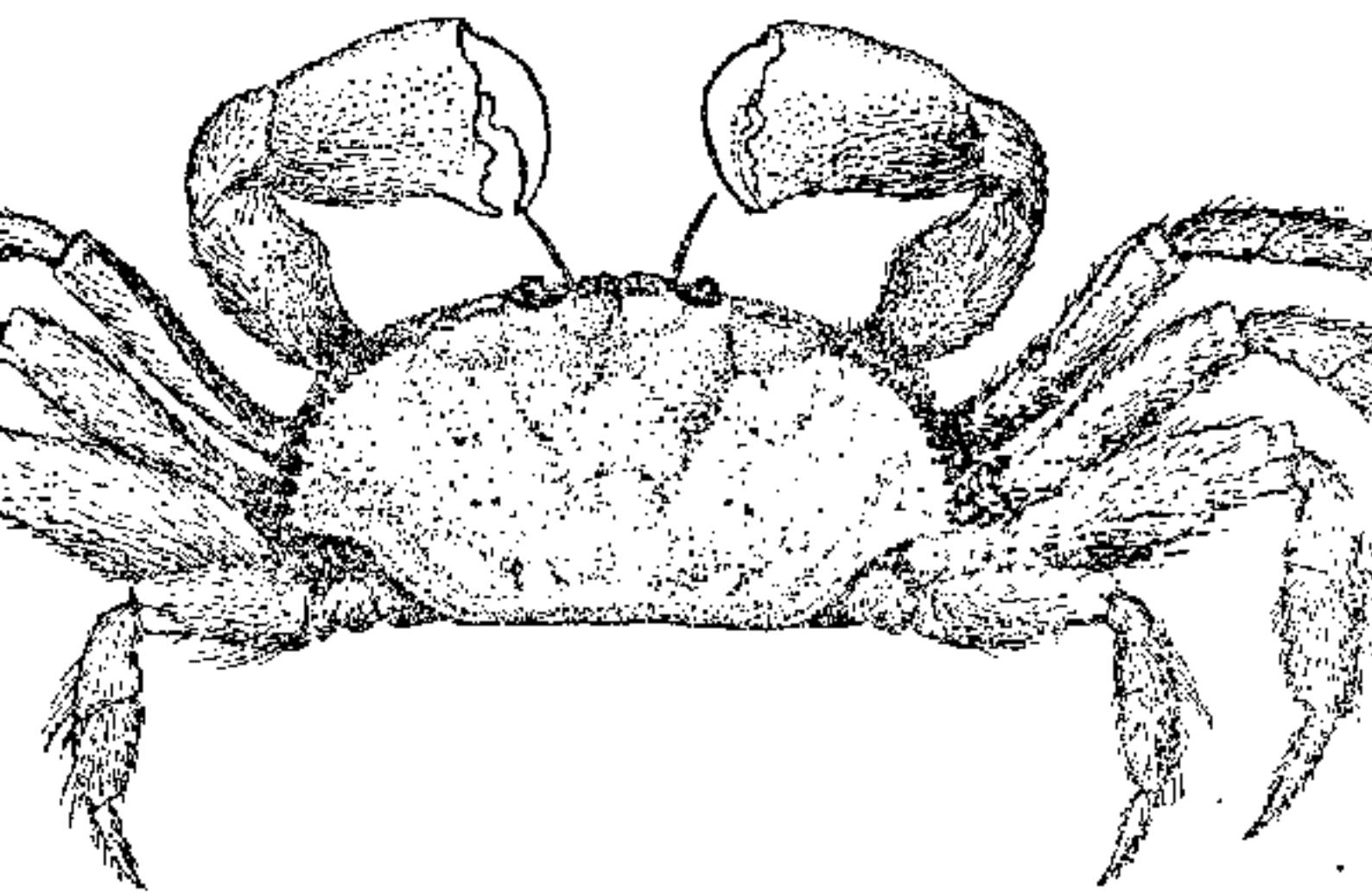
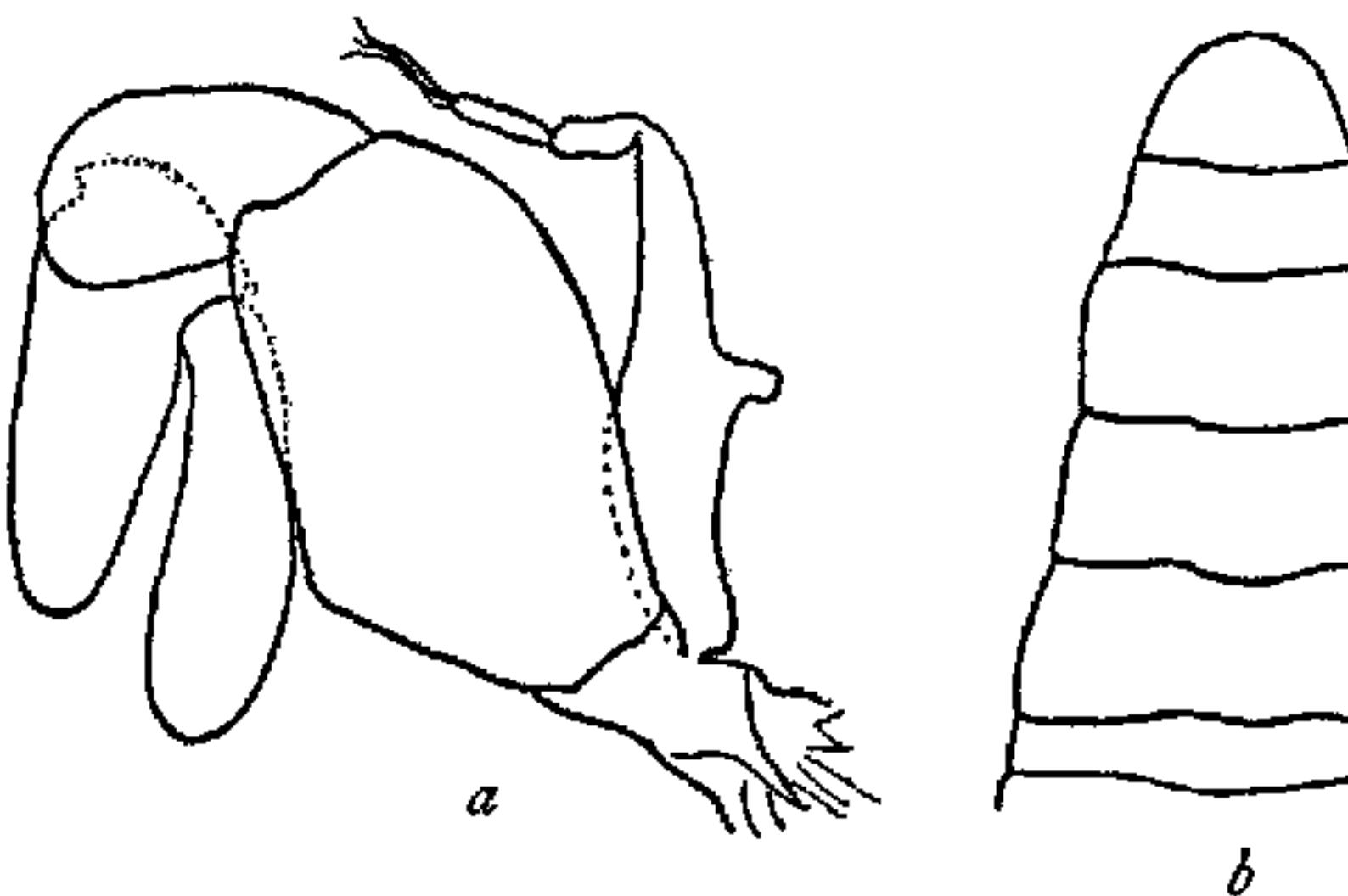


FIG. 107.—*PINNIXA BREVIPOLEX*, FEMALE HOLOTYPE, $\times 2\frac{1}{2}$.

ated. Subhepatic region with a small depression surrounded by a deep groove. Antero-lateral margin armed with from 4 to 6 distant, blunt spines. Lateral angle and followed near hepatic region granules or granules. Inferior margin of carapace. Arms of frontal lobes extend obliquely backward. Chelipeds exceed width of front.

Palps of maxilliped oblong; terminating near base of second joint and overreaching it.

rements.—Female holotype, length of carapace 7.5 mm. Male (21593), length of carapace 6.5 mm.



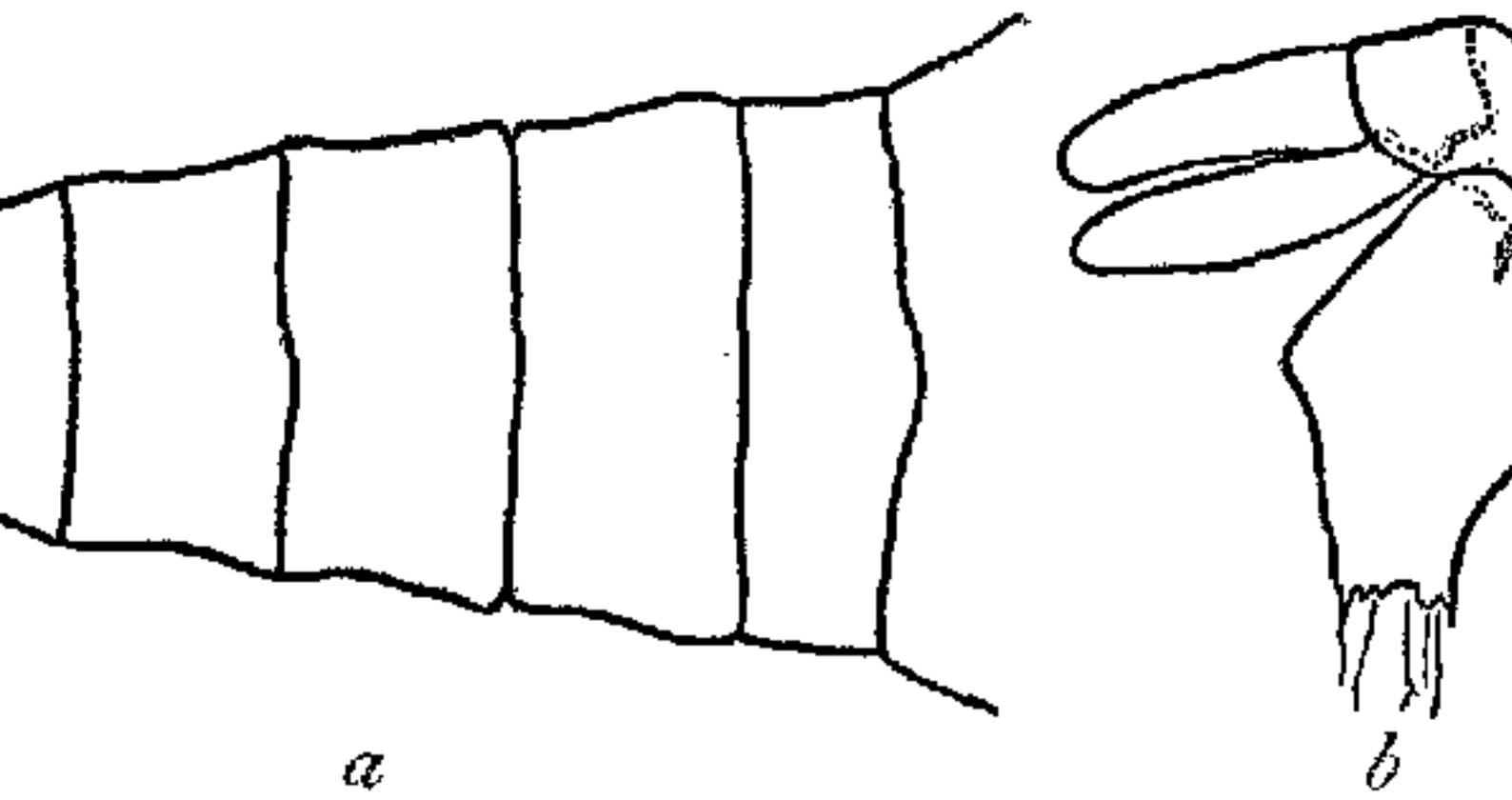
-PINNIXA BREVIPOLEX. *a*, OUTER MAXILLIPED OF FEMALE; *b*, ABDOMEN OF MALE (21593), $\times 7\frac{1}{2}$.

rial examined.—Off Gulf of San Matias, Patagonia S.; long. $61^{\circ} 38' 30''$ W.; 43 fathoms; dk. S.; station 2768, *Albatross*; 1 male, 2 females (1 female parthenogenetic); Cat. No. 21593, U.S.N.M.

Genus SCLEROPLAX Rathbun.

Scleroplax RATHBUN, Proc. U. S. Nat. Mus., vol. 16, 1898, p. 247, figs. 1-3.

Carapace high, not arcuated, less than twice
length of male very wide, of female very feebly
arcuated. Carapace smooth and punctate in
male elsewhere; antero-lateral margin of the
carapace with an arcuate, granulate ridge, which stops short



DOLPLAX GRANULATA. *a*, ABDOMEN OF MALE (49247), $\times 15\frac{1}{2}$.
b, PART OF OUTER MAXILLIPED OF FEMALE PARATYPE, $\times 15\frac{1}{2}$.

margin, and at cervical suture; a separate
on hepatic margin. Front straight as seen from
middle and outer corners; orbits ovate, less than
front. Merus of maxillipeds granulate, an alate ex-
cept; last two joints of palpus elongate, medially
reaching slightly beyond preceding. Chelipedes
especially on dorsal surface; thumb horizontal

y Harbor, Washington; in *Mya arenaria*; D. Way; 1 male, 1 female (49951).

Sound; Aug., 1908; 3 males, 3 females, ov.

Sound, near Tacoma, Washington; 1907; 2 m.), (Stanford Univ.).

Bay, Washington, from stomach of Bufflehead (*albeola*); Dec. 4, 1914; 1 female (Biol. Survey of Agr.).

le San Francisco Bay; 7-4 fathoms; large and fragments; temp. 12.01° C.; Apr. 16, 1912; s. *Albatross*; 1 male (49247).

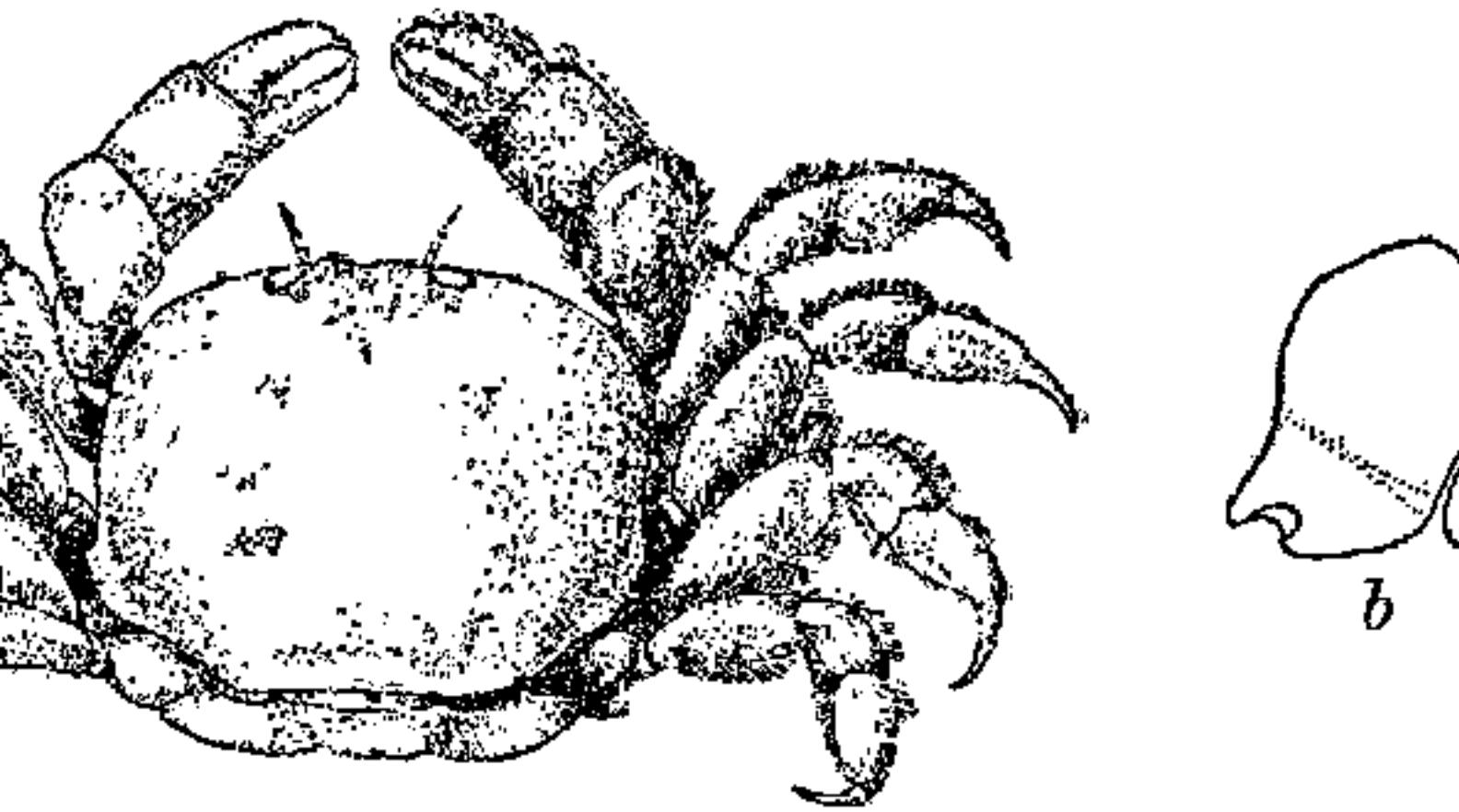
nada, Lower California; C. R. Orcutt; 3 femaleatypes) and fragment of male (17497). .

Genus OPISTHOPUS Rathbun.

Opioporus RATHBUN, Proc. U. S. Nat. Mus., vol. 16, 1893.
transversus Rathbun.

pace subquadrilateral, a little wider than long than in female, smooth; regions not defined; arcuate; front rounding down toward the epipeds with ischium well developed and well defined with the merus; merus wide, palpus 3-jointed, situated near the proximal end of the inner side of int. Ambulatory legs similar and differing

of female.—Carapace highest in middle, w
ard in all directions. Some shallow depressions
the various regions. A border of pubescence
o-lateral margin. True lateral margin of cara



a

XOPUS TRANSVERSUS, FEMALE (23927). a, DORSAL VIEW, \times
DOGNATH OF OUTER MAXILLIPED, \times 8.

ral view. Front not visible from above; in
angular, being longer in middle than at outer
d oval, filled by eyes.

of good size, pubescent, and with margins o
surface of carpus and propodus hairy; palm in
dth to distal end, lower margin convex; sing
horizontal, not gaping, one small tooth at
two or three at base of pollex, tips hooked and

ittle cavity of clam, *Mytilus edulis*; in the
Lucapina crenulata; and in the common
ous californicus.

ve.—Monterey to San Diego, California.
rial examined.—

terey Bay, California: In mantle cavity of
Harold Heath; received Nov. 25, 1898; 1 male
na crenulata; 4 males, 6 females (2 ovig., 1
, subtriangular abdomen) (Stanford Univ.).
terey; C. A. Canfield; 1 male, 3 females (1 o
(3446).

nic Grove: John C. Brown; 6 males, 1 female
cavity of *Mytilus edulis*; John C. Brown; 1 f
miles S. by E. of Point del Rey; Aug. 8, 1913;
cal Station; 1 male y. (49301).

Pedro; H. N. Lowe; 1 female (49211).

acim Landing; from siphon of a piddock (*P*
1 male, 1 female (23051).

Catalina Island; 50 fathoms; H. N. Lowe; 1 ma
na Beach; W. A. Hilton, Pomona College; 1
t Loma; Jan. 28, 1889; steamer *Albatross*;
.

Diego; Henry Hemphill; received Apr. 15, 1
M. C. Z.).

Genus PINNAXODES Heller.

n wide; dactyl of last leg straight-----*tomentosus*

PINNAXODES CHILENSIS (Milne Edwards).

Plate 38.

chilensis MILNE EDWARDS, Hist. Nat. Crust., vol. 2, 1835, p. 13 (locality, Valparaiso; type in Paris Mus.).—MILNE EDWARDS, in d'Orbigny's Voy. l'Amér. Mérid., vol. 6, pt. 1, 1843, p. 13, pl. 9, 1847, Crust., pl. 10, figs. 2 and 2a.

chilensis DANA, U. S. Expl. Exped., vol. 13, Crust., pt. 1, 1851, p. 13.—*hirtipes* HELLER, Reise Novara, vol. 2, Abth. 3, Crust., 1860, p. 6, fig. 2 (type-locality, Ecuador, in an *Echinus*; type in Berlin Mus.).

chilensis SMITH, in Verrill, Amer. Nat., vol. 3, 1869, p. 103; in Connecticut Acad. Arts and Sci., vol. 2, 1870, p. 170.—C. H. RATHBUN, Proc. U. S. Nat. Mus., vol. 21, 1893, p. 696, pl. 23, fig. 8.—RATHBUN, Proc. U. S. Nat. Mus., vol. 38, 1910, p. 587.

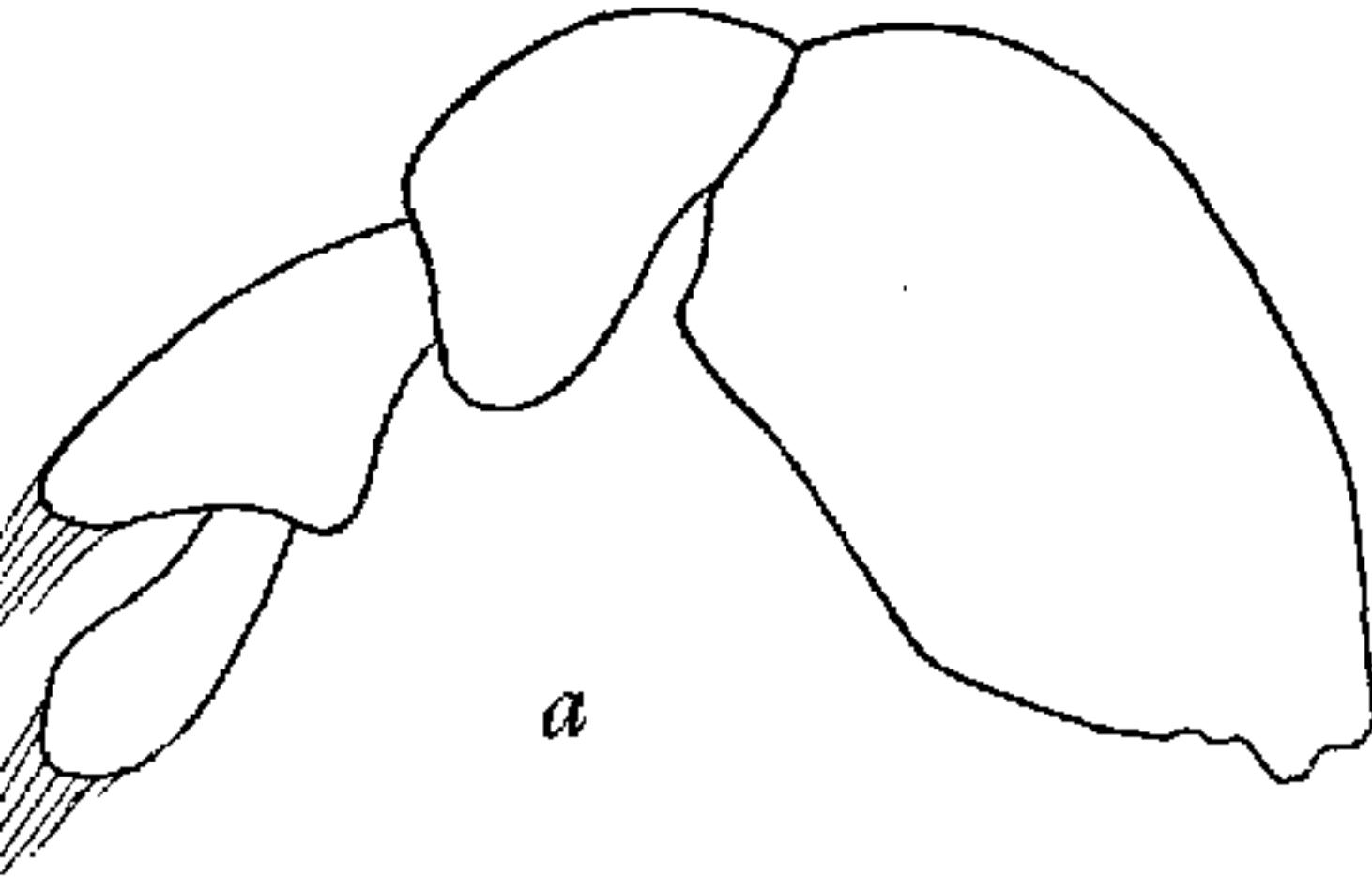
hirtipes? RATHBUN, Proc. U. S. Nat. Mus., vol. 21, 1893, p. 696, pl. 23, figs. 10 and 11.

—Carapace soft in female, firm in male. Palms of chelipeds long and narrow. Legs narrow. Sixth segment of male abdomen elongated.

of female.—Body very soft and yielding; carapace long, subquadrate with rounded corners; posterior margin straight, interrupted by a median sulcus near middle; lateral sulcus very short, not deep and conical. Eyes, but not margin of front, partially hidden by rostrum. Eyes large, black, with long black hair.

Ventral surface of body, including margin of chelipeds, black, with long black hair.

etat.—Parasitic in sea-urchins (*Vaenocentrotus*
vinus albus). Nearly all the specimens of *C.*



—PINNAXODES CHILENSIS, MALE (22112). *a*, ENDOGNATH MUCH ENLARGED; *b*, ABDOMEN, $\times 4\frac{1}{2}$.

States National Museum show evidence of says¹ of a collection of 90 specimens of this examination of the interior showed that in each specimen *) * * * had effected a lodgment in the upper part which had thereby been greatly distended in the form attached to one side of the shell and extending around near the mouth. The shell is usually swollen on the side anal area is depressed and distorted, with a large opening into the cyst, out of which the crab may thrust its apparently unable, when full grown, to come entirely out confined in the cyst may find a way out by

Loxechinus albus (Molina); Feb. 9, 1888; *Atbaraross*; from *Loxechinus albus* (Molina); Feb., 1888; A 235).

—For discrepancies between the figures of Milne and those of Heller, see Smith.¹ This species, I add, represents the ischium and merus of m. used, but specimens examined by the writer show no suture line.

from Chiloe shows the pits on the carapace in the male from Port Otway; there are 4 in a square in the cardiac region; in front of the anterior pair, each of which forms a corner of a rhomb on each

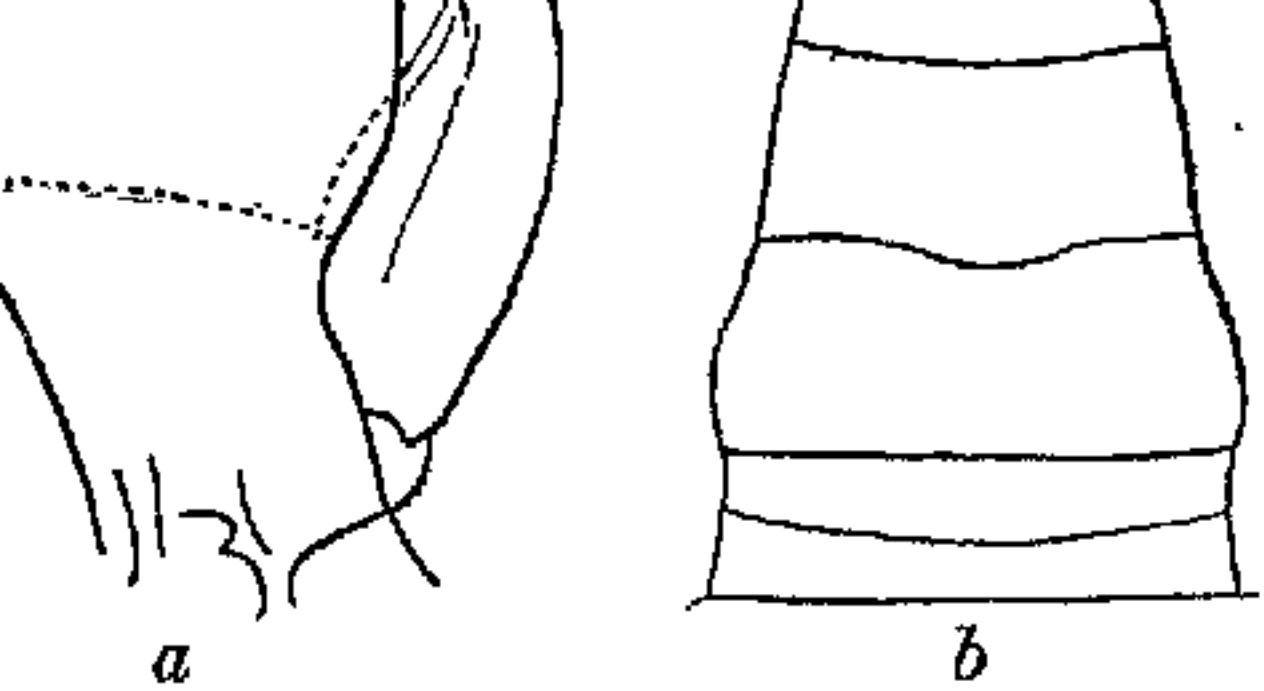
PINNAXODES MEINERTI Rathbun.

. Plate 25, figs. 1-3.

meinerti RATHBUN, Proc. Biol. Soc. Washington, vol. 50, p. 102, 1937. (Type locality, Valparaiso, Chile; holotype male in C

—Carapace firm in both sexes, wider than in female short and broad. Legs short and broad. Subabdomen not constricted.

of male holotype.—Lower surface of body, including ambulatory legs, with a thin, felt-like coat; anterior margin of basal portion of ambulatory legs with long hairs. Carapace obovate, a little broader



—PINNAXODES MEINERTI. *a*, OUTER MAXILLIPED
MALE (5760), $\times 15\frac{1}{2}$; *b*, ABDOMEN OF MALE HOLO-
 $\times 8$.

Fingers gaping when closed. Dactyli of legs longer than in male. Abdomen longer but no wider than in female. Measurements.—Male holotype, length of carapace 9 mm. Female (M.C.Z.), length of carapace 3.8 mm.

—Chile: Valparaiso to Talcahuano.

Material examined.—

Valparaiso; Mr. Krøyer; 1 male holotype (Copenhagen); Talcahuano; Hassler Exped.; 1 female (5760, M.C.Z.).

PINNAXODES TOMENTOSUS Ortmann.

Pinnaxodes tomentosus ORTMANN, Zool. Jahrb., Syst., vol. 7, 1894, p. 697, pl. 23, figs. 9, 9*i* (type-locality, Brasilien; cotypes in Strassburg Mus.).



transversely oblong, hard, regions indicated, flattened, anterior third deflexed; antero-lateral angles steep. Ischium well developed, distinct from large, joints end to end, the last two joints very long, point attached near inner end of distal margin. Chelipeds stout. Legs diminishing, from second to fourth small; first and third subequal. Abdomen oval, at base only half width of sternum, tip overreaching it.

In Indo-Pacific and Gulf of California.

TETRIAS SCABRIPES Rathbun.

Plate 39, figs. 4 and 5.

Scabripes RATHBUN, Proc. U. S. Nat. Mus., vol. 21, 1893, p. 123, figs. 12-14 (type-locality, Gulf of California, 9½ fathoms, female, Cat. No. 21595, U.S.N.M.).

—Carapace transverse, oblong, uneven, hard. Chelipeds very large, segments end to end. Chelipeds spinulous. Second leg longest, fourth very short.

of female.—Carapace covered with a short, dense, dark setae, beneath which the surface is punctated by impressed lines and pits, the deepest

roughened, carpus and propodus proportionally longer than leg; third leg reaches to about middle of propodus. Tarsal claws simple. Meri-
ents resemble those of second pair but are un-
reduced, not reaching end of merus of second
pair. Lower margin of ischiu-



TETRIAS SCABRIPES, FEMALE HOLOTYPE. *a*, RIGHT CHELAL
MAXILLIPEDS, $\times 5\frac{1}{2}$; *c*, DORSAL ASPECT, $\times 2\frac{3}{4}$.

with spines and spinules, dactylus very small.
tae like those on carapace and fringed with

men of female fringed with long hair.

Measurements.—Female holotype, length of carapace 17.5 mm., width of dorsal surface at middle 9.2 mm.

trial examined.—Southern part of Gulf of C
00" N.; long. $109^{\circ} 55' 00''$ W.; $9\frac{1}{2}$ fathoms;
station 2826, steamer *Albatross*; 1 female o

INNOXIELIA LAEVIGATA Milne Edwards and Lucas.

Plate 39, figs. 1-3; plate 40, figs. 1 and 2.

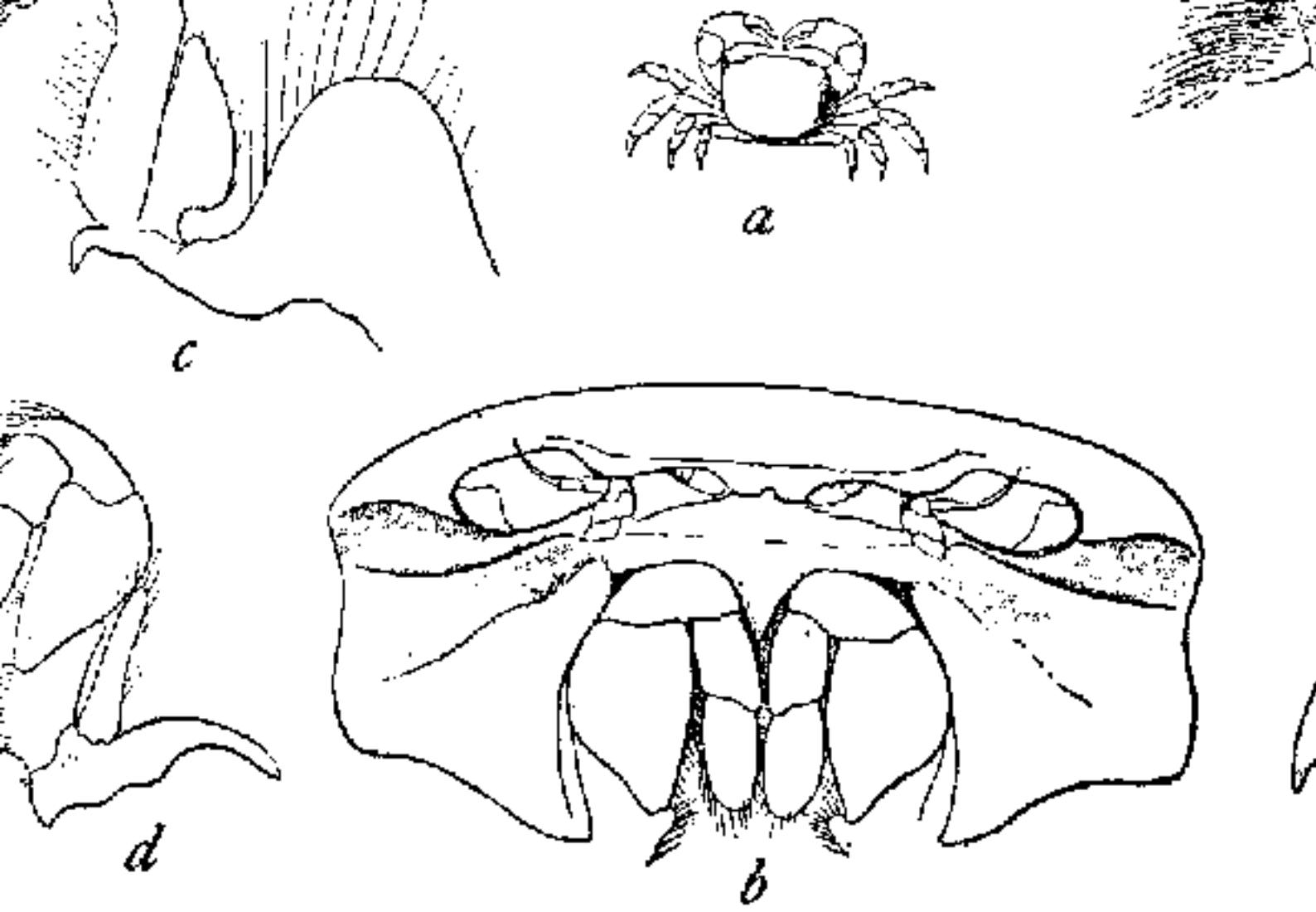
us (?) gnatherion KINAHAN, Journ. Roy. Dublin Soc., v. 1, pt. 1, p. 10 (type-localities, Chincha Islands and Callao; type in Royal Dublin Soc.).

Zia laevigata MILNE EDWARDS and LUCAS, in d'Orbigny, MÉM. MÉRID., vol. 6, pt. 1, 1843, p. 25 (type-locality, Chile; Mus.).

Zia loevigata MILNE EDWARDS and LUCAS, in d'Orbigny, MÉM. MÉRID., vol. 9 (atlas), 1847, pl. 11, figs. 1-1e.

—Carapace transversely oblong. Eyes far apart. Cheliped with all three joints large, end to end. Dorsal margin at an acute angle with dorsal plane. Cheliped longest.

.—Carapace subquadrilateral with the corners wider at anterior than at posterior angles; longitudinal groove each side of the cardiac region; flat except in its middle which is strongly bent down; front two-fifths as slightly arcuate in dorsal view, true edge seen only transverse except at middle; posterior margin below lateral margin acute. Chelipeds and legs smooth, without thickness of any kind. Outer surface of wrist smooth, upper and lower margins convex, distal margins similar, narrowly gaping, tips pointed almost horizontal. Legs thick, flattened, margins of merus



—PINNOTHERELIA LAEVIGATA, MALE HOLOTYPE. *a*, DORSAL VIEWS OF HEAD AND BUCCAL REGIONS; *c*, FIRST MAXILLIPED; *d*, OUTER MAXILLIPED; *f*, EXTREMITY OF A LEG; *b-f* ARE ENLARGED. (AFTER CAS.)

Family CYMOPOLIIDAE Faxon.

opoliidae FAXON, Mem. Mus. Comp. Zoöl., vol. 18, 1895
cae BOUVIER, Bull. Soc. Philom. Paris, ser. 8, vol. 9,
 and 58 [5].

cidæ ALCOCK, Journ. Asiat. Soc. Bengal, vol. 68, 1895, p. 450.—RATHBUN, Bull. U. S. Fish Comm., vol. 20, for 1901, p. 12.—BORRADAILE, Ann. Mag. Nat. Hist., ser. 7, vol. 19,

space broadly transverse, subquadrilateral; antennæ inserted. Fronto-orbital width great, front depressed. Buccal cavity quadrate; outer maxillipeds with strong, unproduced forward on the inner

ILIPPI, Zweiter Jahresber. d. Vereins f. Naturk. in Ca
type, *P. granulatus* Philippi = *C. caronii* Roux.—RATH
Soc. Washington, vol. 11, 1897, p. 165.—A. MILNE ED
CE, Mem. Mus. Comp. Zoöl., vol. 27, 1902, p. 40.

more or less depressed, broader than long, sub
granules and with symmetrical tubercles or
tendency to fall into transverse series.

badly triangular, horizontal, usually lobed or
all borders of carapace straight or little cur
or toothed.

p, the upper border cut into several teeth by
lefts; the lower border usually has two clefts
cted in the middle and bearing two or more
s.

: nearly transverse, interantennular septum a
1 antennal joint enlarged, standing in orbita
ll developed.

sunken, not defined. Buccal cavity square; at
here is a lobe formed by a prolongation of the
region, and overlapping to a variable extent the
orbit; the buccal or pterygostomian lobe is some
times bent down toward a vertical plane; it is deflexed in the young and horizontal in the
skillipeds do not close the buccal cavity anteriorly; they meet in the middle; merus much smaller and

New England to Cape Frio, Brazil; eastern
Mediterranean; Indo-Pacific from the western Indian
Ocean Islands; Pacific coast of America from Gulf
of California to Ecuador. 4 to 298 fathoms.

Characteristics of the American species.—The genus includes groups ranging from the typical one, with rather long legs, with large and usually thin antero-lateral teeth which are an integral part of it, and with legs of moderate length (ranging from one-half to twice as long as width of carapace), to the group with very swollen carapace, small, thick, tuberculiform teeth, and antero-lateral teeth which project outside the carapace, and with long slender legs (ranging from one-half to twice as long as width of carapace). To the first group (typical) belong *cristatipes*, *alternata*, *zonata*, *lucasi*, *gracilis*, *floridana*, *gracilipes*, and *acutifrons*. Between these extremes are various modifications as follows: a group of *rathbuni*, *bahamensis*, and *isthmia* with short antero-lateral teeth, distant from each other, or finely serrated, combined with a typical carapace and short legs; a group in having the two frontal lobes very feeble, and the other small group allied to the typical one but with large plates of abdomen and sternum which are convex; this group includes *sica*, *angusta*, and *depressa*. A group with convex carapace, prominent tubercles on the most terminal segments of the legs, and a

teeth on anterior margin except the distal tooth.	
terygostomian lobe reaching well beyond inner lobe-----	rathbuni
terygostomian lobe not reaching beyond suborbital lobe	
Antero-lateral teeth near together, wider than in sinus.	
¹ . Antero-lateral teeth blunt-----	alternans
² . Antero-lateral teeth acute.	
H ¹ . Outer margins of exorbital teeth converging	
Posterior margins of propodus and dactylus ambulatory bare in mature male-----	200
H ² . Outer margins of exorbital teeth subparallel. Posterior margin of propodus and dactylus of first ambulatory with shaggy hair in mature male-----	argenteum
Antero-lateral teeth distant, narrower than in sinus-----	bahamensis
merus of second or second and third ambulatory legs	
ero-distal angle a prominent lobe which ends in a sharper suborbital lobe strongly convex on anterior margin. Antero-lateral teeth blunt.	
last leg reaches end of merus of third leg. Two lateral teeth on carapace-----	oblongum
last leg falls short of end of merus of third leg. Two lateral teeth on carapace-----	tuberculatum
mer suborbital lobe truncate and nearly straight on anterior margin. Antero-lateral teeth acute.	
front quadridentate, teeth well separated. Antero-lateral teeth adjacent, sinus narrower than either tooth.	
Outer orbital tooth pointing straight ahead. The two sinuses very distinct from the prominences.	

- ter suborbital lobe with margin concave forward.
Front quadridentate
Front bidentate *gr*
ter suborbital lobe in form of a triangle.
Outer suborbital lobe a low, obtuse triangle *aci*
Outer suborbital lobe a produced, equilateral triangle.
. One lateral tooth and one tubercle. Second leg $3\frac{1}{2}$ times width of carapace
. Three lateral teeth. Second leg 3 times as long as carapace *fl*
r suborbital lobe visible from above and almost as large as a erygostomian lobe. One larger lateral tooth between lobes or denticles

CYMOPOLIA CRISTATIPES A. Milne Edwards.

olvia cristatipes A. MILNE EDWARDS, Bull. Mus. Comp. 80, p. 28 (type-locality, Grenada, 92 fathoms; holotype, M.C.Z.).

cristatipes RATHBUN, Proc. Biol. Soc. Washington, 193.—BOUVIER, Bull. Soc. Philom. Paris, ser. 8, vol. 9, 1895.—MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zoöl. 42, pl. 7, figs. 1-5.

sis.—Merus of ambulatory legs with three or four teeth on border. Carapace with four lateral teeth before orbital margin oblique.

ption.—Five lateral teeth, including orbital, dimorphic, anterior to posterior tooth; outer margin of cheliped ex, an interval between that and next tooth, which



.; long. $62^{\circ} 04' 15''$ W.; 96 (not 92) fathoms; 65° F.; Feb. 27, 1879; station 253, U. S. C. S. holotype (Cat. No. 6494, M. C. Z.).

CYMOPOLIA ALTERNATA (Rathbun).

Plates 42 and 43.

alternatus RATHBUN, Proc. Biol. Soc. Washington, 95 (type-locality, lat $29^{\circ} 11' 30''$ N.; long. $85^{\circ} 28'$ fathoms; holotype, Cat. No. 19840, U. S. N. M.); Bull. Bur. Fish., vol. 20, for 1900, pt. 2 (1901), p. 12 (part).

Blakei A. MILNE EDWARDS and BOUVIER, Bull. Mus. Hist. Natl., vol. 5, 1889, p. 123 (type-locality, Gulf of Mexico); Mem. Acad. Brésil., vol. 27, 1902, p. 48, pl. 8, figs. 13-16 (type-locality; long. $83^{\circ} 86'$ W., 37 fathoms; holotype at present in Paris).
Diagnosis.—Two blunt lateral teeth. Sides of carapace anteriorly. Propodus of legs two and three slightly longer than anterior distal lobe of merus subrectangular. Dactylus of propodus and proximal half of dactylus of leg covered with long silvery hair in adult male.

Description of typical specimens.—Elevations of carapace and tubercles composed of a few granules and small tubercles composed of a few granules and

granules. Four fronto-lateral tubercles well defined; median sinus deep. Lateral triangle, lateral margin of carapace, small but well marked. Lateral teeth much less advanced than in *alternatus*.



est, its outer surface covered with irregular l
s surmounted by a double crest of same; right m
dth at distal end may equal one-half length of
finger short and wide, dactylus strongly bent d
fixed finger and leaving a narrow gape; l
one-third width of right, fingers long and na
or weaker form of male, the right manus is a
left, its fingers long and slender. In the f
e more nearly equal.

ambulatory legs, the first reaches middle of pr
nd reaches middle of dactylus of second; me
squamose tubercles, a longitudinal groove o
f same on upper surface, an obtuse tooth at
e first leg is subtriangular and produced a litt
ment, in second and third legs is subrectangu
a little convex above and reaching in second l
to end of segment, and in third leg not reach
terior proximal lobe of carpus rounded, som
terior subdistal lobe low and rounded on firs
second and third legs, posterior distal tooth i
r margin of propodus convex, posterior strai
of propodus and proximal half of dactylus c
a shaggy hair in adult male.

In first form of the male the appendages of the first
stout and twisted, tip bilobed, inner lobe th

small specimens of both sorts the pterygostomium is broader than in larger examples, and in consequence wider than the inner suborbital lobe, as in the type of *Cymopolia*. There is also considerable variation in other particular features, such as width of frontal teeth and sinuses and details of orbit.

Measurements.—Male holotype, greatest length of carapace 10.8, width of same 7.6, length of second ambulatory 14; largest female (5281), greatest length of carapace 8, width of same 6.5 mm.; variety (49140), greatest length of carapace 11.3, width of same 7.3; largest female of variety (19854), greatest length of carapace 13.6, width of same 16.5 mm.

—Off Cape Hatteras, North Carolina; Gulf of Mexico; coast of Florida from Cape San Blas to Key West.

All examined.—See page 191.

CYMOPOLIA ZONATA Rathbun.

Plate 44, fig. 3; plate 45, fig. 1.

Zonata RATHBUN, Proc. U. S. Nat. Mus., vol. 18, p. 102, 1896. Type-locality, Gulf of California, 40 fathoms; holotype (U.S.N.M. No. 484).

Zonatus RATHBUN, Proc. Biol. Soc. Washington, vol. 18, p. 102, 1896; Proc. U. S. Nat. Mus., vol. 21, 1898, p. 600.

Diagnosis.—Middle supra-orbital lobe obliquely truncated.

gin, forming two lobes, the inner pointed. Pterygostomian lobe I and bent in an oblique plane, its concave.

Chelipeds very unequal in size; the right one larger, its manus granulate, and there is a prominent ridge on upper margin of outer



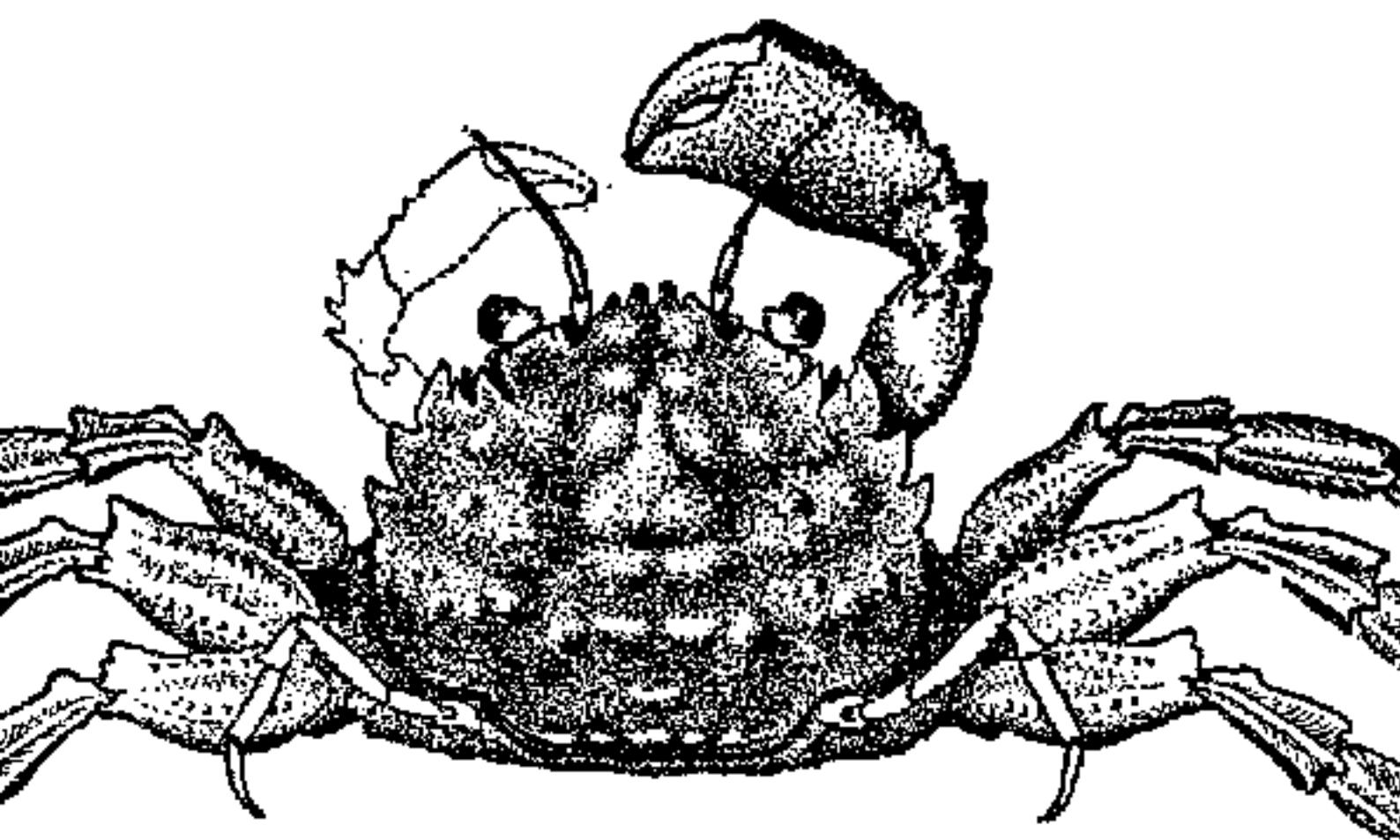
FIG. 118.—*CYMOPOLIA ZONATA*, OUTLINE
OF ABITS OF MALE (22071), X

below it a short ridge leading back to a
dyle of dactylus; fingers wide, g

Ambulatory legs rather short; thick, with serrated ridges; first prominent, narrow, rounded, distal and third merus with a thin, angled tooth, not projecting distally; lobe of carpus low and rounded; second and third legs subrectangular; margin of propodus slightly curved.

First four segments of male a

stinct, those on cardiac and intestinal regions
rest; fine granulation of depressions rather



—*CYMOPOLIA LUCASII*, MALE HOLOTYPE, DORSAL VIEW, X NEAR

lobes well marked, median pair extremely narrow, deep and narrow triangular fissure which is lateral fissures short, also rounded. The bristle which covers the eyestalk has a closed fissure, the lobe overlapping the inner and forming a hook on the anterior edge. Middle and outer lobes

d second; propodus of leg 1 with a shaggy coar
or border in male only; propodus of 2 and 3
ng distally; dactylus wide and with sinuous po
urements.—Male holotype, greatest length of
of same 15.7, length of second leg 25.7 mm.

ve.—Lower California, Mexico: off Cape St. Lu
rial examined.—Off Cape St. Lucas, Lower C
2° 52' 00" N.; longitude 109° 55' 00" W.; 31
74.1°; May 1, 1888; station 2829, *Albatross*;
pe), 4 females (21590).

CYMOPOLIA FAXONI (Rathbun).

Plate 45, figs. 2 and 3.

Cucus faxoni RATHBUN, Proc. Biol. Soc. Washington, v
(type-locality, off Cape Hatteras, *Albatross* station
Cat. No. 19841, U.S.N.M.).

nosis.—Two acute lateral teeth. Merus of le
lat, acute, distal spine. Tip of pterygostomia:
ription.—Carapace shaped as in the varietal
that is, with the sides distinctly converging at

pace of adult fo
vex, surface li
numerous tuber
ules; the gran



Identification doubtful.

by the pterygostomian lobe, which what bent down and is triangular sharp tip, reaching just as far forward as the inner angle of orbit.

Chelipeds in both sexes little unequal, the right manus about twice as wide as left.

Ambulatory legs short and broad, a triangular, sharp anterior tooth on the joints, the first one narrowest, the third than the second; posterior distal margin of merus sharp; lobes of carpus prominent, distal one of second and third leg propodus of those legs widening greatly proximal to distal end; dactyli wide, margin sinuous.

Affinity.—On the whole, this species approaches nearest *Cymopolia affinis*, with similar teeth on the carapace, but has large flat, triangular teeth of the chelipeds and the legs.

Measurements.—Male (station xxx) greatest length of carapace 9.5, width 10 mm.; female holotype, greatest length of carapace 9.5, width of same 10.7, length of second leg 18 mm.; female (Yucatan)

os, 69 fathoms; holotype, Cat. No. 6507, M. C. Z.).
Cymotolia agassizii A. MILNE EDWARDS and BOUVIER, Mem. Mus. Col. 27, 1902, pl. 8, figs. 5-12.

C. alternatus RATHBUN, Bull. U. S. Fish Comm., vol. 2 (1901), p. 12 (part: male specimen from St. Thomas).—Two acute lateral teeth. Posterior margin of telson with two acute lateral teeth. Posterior margin of first ambulatory clothed with shaggy hairs. Dactyli of legs 2 and 3 with posterior margin subacute; those of legs 2 and 3 obtuse.

Description.—Near *C. alternata*. Carapace covered with granules and short hairs. Median sinus of front arm

V. Mie

supra -
subtriangular;
the m
larger,
ward;
tooth
ward



—CYMOTOLIA AFFINIS, OUTLINE OF FRONT AND ORBITS OF MALE (24515), X 6.

margin more or less convex, tip pointed. Two large, triangular, lateral teeth, hooked forward and slightly by a rudimentary tooth. Ridge above posterior margin irregular, composed of transverse, irregular tufts. Border oblique, denticulate, inner lobe bilobed, tip slightly farther advanced than the pterygostomian tooth, downward and forward and terminates in a

Son.	do.	do.	Fish Hc.	Blake
60	25	20-23	C. 25.8 Feb. 6, F. 65	1916 1899 8079
17 37 55 N	64 54 20 W.	117	R. brk. Sh.	Jan. 5, 1879
13 04 60	59 37 40	69	C. Sn. do.	Mar. 6, 1879

• Holotype of

Not 295.

T. P. O'FARRELL

cave. The tooth on metatarsus and 3, although usually acute on right side only of specimen. The anterior distal carpus of the same leg acuteness.

Color.—From a newly specimen. Ambulatory leg with reddish orange-brown lowish ground; third leg banded, mostly yellowish. dull light brown mottled with brown. Chelipeds same uniform as leg bands.

Measurements.—Male greatest length of carapace 1 of same 14.8, length of second mm.; female (49142), greatest of carapace 9.9, width of same

Range.—Charlotte Harbor, Miami, Florida; St. Thomas; St. Lucia, Barbados. 20–117 fathoms.

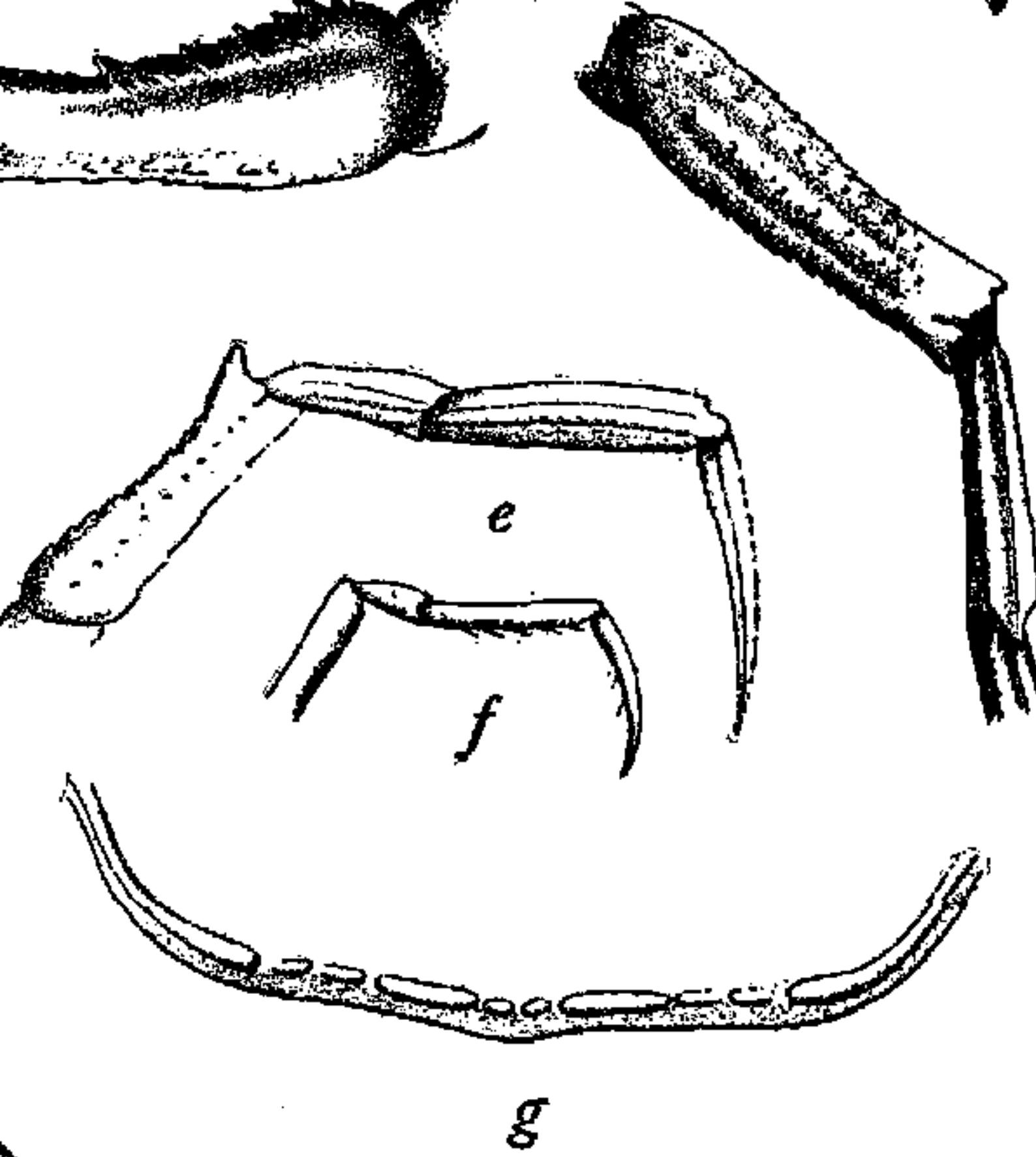
Material examined.—See t

Remarks.—I think that the *agassizi* is a young specimen.

olescent. Lateral emarginations of front m
l lobe subtruncate, far back and exceeded
lobe and by lobe of exognath.

Description.—Carapace with areulations not sharply c
with large granules and granulated tubercles, a
the largest tubercles are four across cardiac reg
tion of front much wider than deep; lateral e
-shaped. Middle lobe of supra-orbital margin
se, outer margin convex; next lobe narrower, i
outer margin partially overlapping outer o
is directed obliquely outward and forward
and turned inward. Remaining teeth of lateral
er, well separated, blunt, the first the larger;
early straight and transverse, posterior margin
Anterior margin of second tooth concave and tran
gin longitudinally oblique and straight; margin
. Posterior margin ornamented with a convex
row of tubercles, two long ones, separated by
followed on either side by two of medium le
uborbital margin transverse, truncate, slightly
is also the oblique inner lobe which is almost
y the pterygostomian lobe, which has a broadly
and by the lobe of the exognath. First movable
strongly widened distally.

of female slender, feeble.



OPOLIA RATHBUNI, FEMALE HOLOTYPE, AFTER A. MILNE ED
IGHT OCULO-ANTENNAL REGION, VENTRAL VIEW, $\times 20$; b, RIG
ON OF CARAPACE, DORSAL VIEW, $\times 14$; c, SECOND LEFT LEG, V
US AND CARPUS OF THIRD RIGHT LEG, UPPER FACE, $\times 11\frac{1}{2}$; d,
CE, $\times 11\frac{1}{2}$; f, EIGHT LAST LEG, $\times 11\frac{1}{2}$; g, POSTERIOR BORDER

specimen the outer corner of its ventral view.

CYMOPOLIA BAHAMENSIS (Rathbun)

Plate 47, figs. 1 and 2.

Palicus bahamensis RATHBUN, Proc. U.S. Natl. Mus., vol. 11, 1897, p. 9, based on specimen from Andros Island, Bahamas (U.S.N.M. Cat. No. 11394); Bull. State Univ. Iowa, vol. 4, 1898, p. 10, based on specimen from Barbados, which is the type (pl. 8, fig. 2).

Diagnosis.—Ambulatory legs one and one-half times as long as width of carapace in mature male clothed with shaggy hair; anterior margin of propodus and pro-dactylus. Lobes on anterior margin of ambulatory legs well marked. Median lobe advanced, far exceeding orbital lobe. Front bilobed.

Description.—Carapace very coarsely granulated. Front divided by deep V-shaped notch into two lobes, which is faintly emarginate. Two lobes triangular, obtuse. Outer

concave. Posterior margin of propodus and dactylus clothed with shaggy hair in mature male. First two abdominal segments of male trilobate in dorsal view, the first the wider; third segment in middle, partially visible in dorsal view. Crest on dorsal surface, or that between bases of third legs, about one-third of second abdominal segment, its posterior margin sinuate. — Male (22301), greatest length of carapace 9 mm.

Bahamas; dredged, to a depth of 97 fathoms. Specimens examined.—

Off Andros Island, Bahamas, in tongue of ocean; lat. 26° 45' N.; long. 77° 12' 45" W.; 97 fathoms; wh. O. C. Dr. 13, 1886; station 2651, *Albatross*; 1 male

anks; May 18, 1893; State Univ. Iowa Exped. (22301); 12 males, 18 females (Mus. S. U. I.).

Cay, Bahamas; in oyster dredge; June 30, 1900; Geogr. Soc. Baltimore; 1 male (31060).

CYMOPOLIA ISTHMIA (Rathbun).

Plate 4S, figs. 3 and 4.

Isthmia RATHBUN, Proc. Biol. Soc. Washington, vol. 11, no. 1, 1899, p. 10, pl. 1, fig. 1; type locality, near Aspinwall; lat. 9° 27' N.; long. 79° 5' W.; holotype, Cat. No. 7753, U. S. N. M. S.

— Lateral lobes of front obsolescent. Anterior

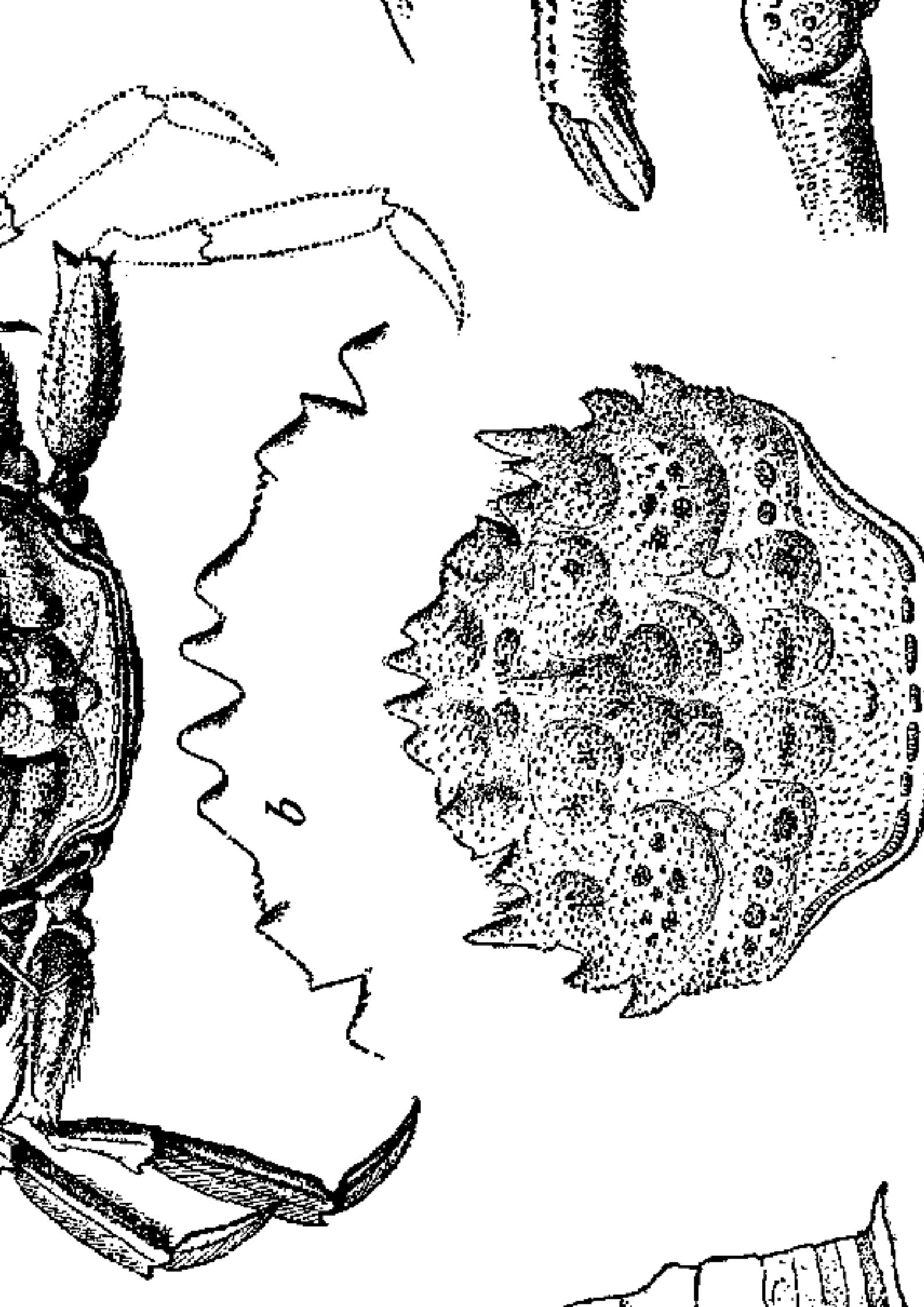
tubercles. Outer margin transverse and slightly convex; inner covered by pterygostomian lobe in ventral view; a little convex, inner angle a small, sharp spine; lobe more produced than orbital lobe, arcuate, not forming an obtuse angle at inner extremity. Legs of male not known, of female very slender; joints of ambulatory legs rather slender, very few of the more proximal spinules of the anterior margin; the distal lobe is triangular and acute, and its tip long, sharp tip; anterior lobes of carpus inconspicuous and narrow, their posterior margins proximally straight.

Remarks.—Immature female, holotype, greater length 5.8, width of same 7, length of second leg 13.7 mm.

Spatial examined.—Off Colon, Panama; lat. $9^{\circ} 27' 00''$ W.; 25 fathoms; gn. M. brk. Sh.; Apr. 2, 1902; batross; 1 female immature, holotype (7753).

CYMOPOLIA DENTATA A. Milne Edwards.

polia dentata A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 28 (part; not specimen from Santa Cruz) (type-locality, Charlotte Harbor, 50 fathoms, and Barbados, 69 and 76 fathoms).
obesus dentatus A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., 27, 1902, p. 53, pl. 9, figs. 15-17; pl. 10, figs. 1-6; type-locality, Charlotte Harbor, 50 fathoms; holotype (U.S.N.M.). In the synonymy, instead of "obesus," read "obesus".—First antero-lateral tooth distant from orbital teeth triangular. Tubercles above post-



			Stimpson S. U. S. Exped.	
			Blake	do...
		278		272
	June 24, 1893			
			Mar.	Mar.
			6,1879	5,1879
			Co. Sh...	Co. brk. Sh...
Lat. itude.	50° 15'	69		
Long. itude.	Sand Key about 10 m. 13° 04' N.	Light bearing W. " " 37° 40' W. 13° 04' 12' N.	59° 38' 45' W.	

inner lobe more advanced; outer corner rounded, inner small vertical tooth; postero-lobe about half as wide as angular.

Right cheliped of male between two-fifths and one-third as long as carapace is long.

Merus of ambulatory leg a large, acute, projecting, anterior distal angle; granular surface small, depressed; lateral margin prominent; propodus broadening much distally; posterior dactylus strongly sinuous.

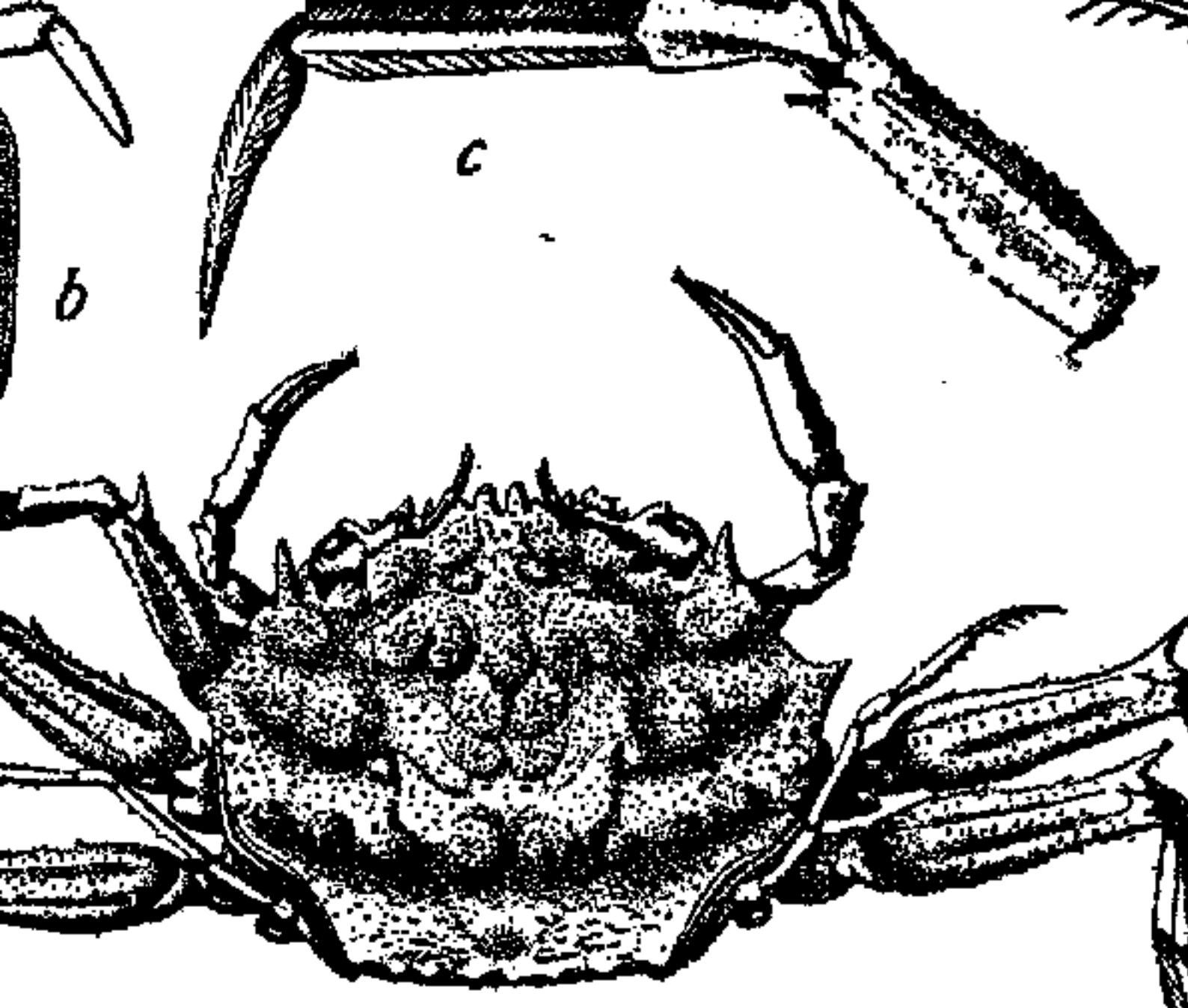
Color.—Yellowish-rose in life.

Measurements.—Male type. Total length 13, width 14 mm.

Range.—From Charlotte Harbor, Florida, to Barbados. 15

Material examined.—See page 15.

Affinity.—Near *C. obesa*, but less convex, its tubercles being absent from the elevations which



a



e

f

OPOLIA OBESA, IMMATURE FEMALE (NOT MALE) HOLOTYPE, AFT.

Type figured by Milne Edwards and Bouvier.

concave. Posterior margin
eight tubercles, of which f
and prominent. Outer lobe
margin very convex, inner
lique, slightly convex, inner
tooth; this lobe is a little m
concealed in ventral view
blunt-pointed pterygostomia
is slightly deflexed and is
advanced than the lower r
orbit.

Chelipeds of male weak, two-thirds as high as the m., as long as upper margin of

Merus of ambulatory leg
gular, with three anterior c
surface scantily granulous,
narrow, sharp, produced be
ment; anterior lobes of carp
veloped; propodus and dacty
and third legs wide, poster
dactylus sinuous.

A transverse ridge on each segment 1-6 of the male abdomen, segment arched forward.

subor-
ry con-
of car-
ulatory
eloped.
n.—Al-
obesa.
wider
mial re-
ulation
ner be-
upon
while the
true in
n sinus
more
base;
l lobes
little
; three
l teeth
orbital,
wo; in
adimen-
tuber-

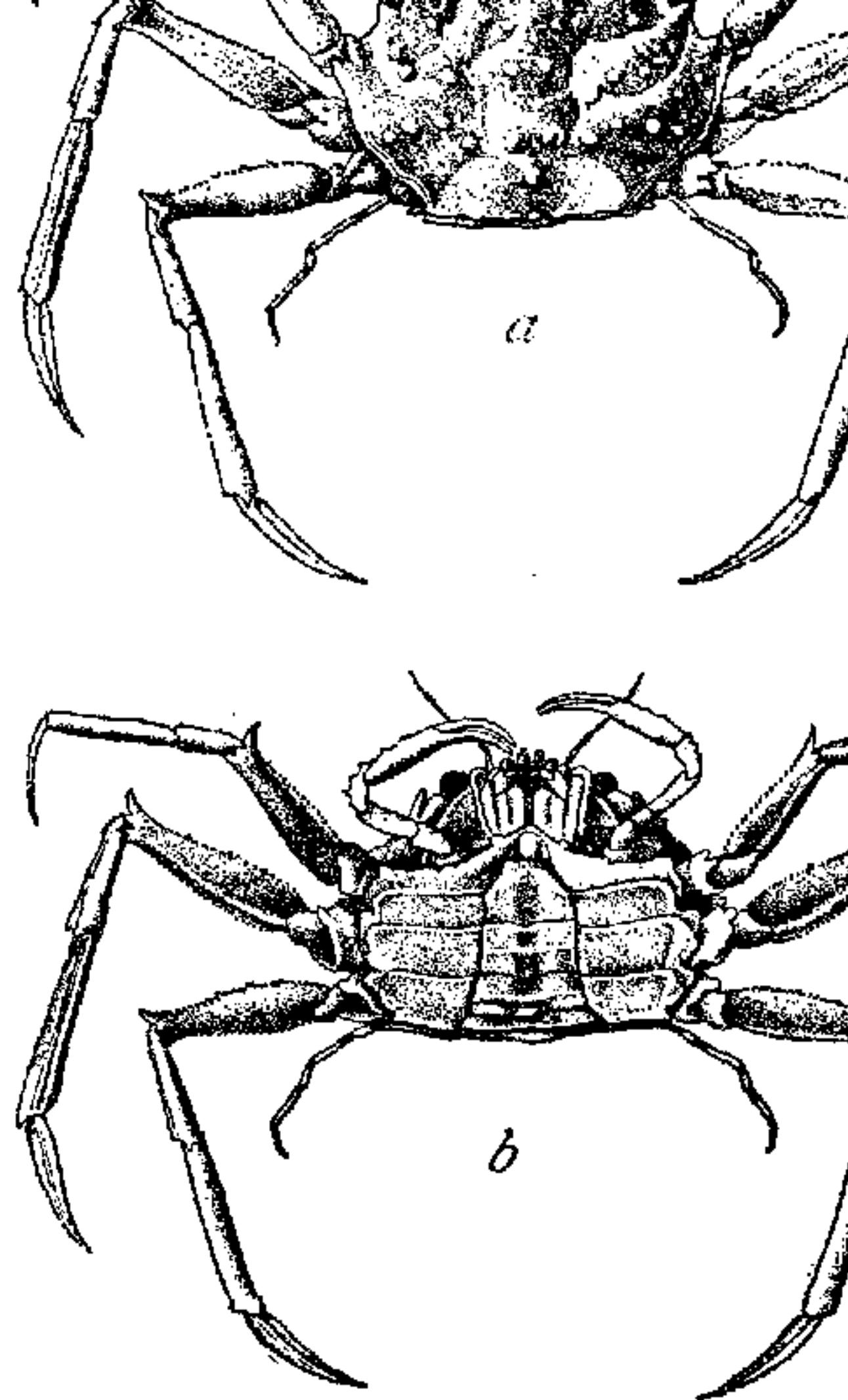
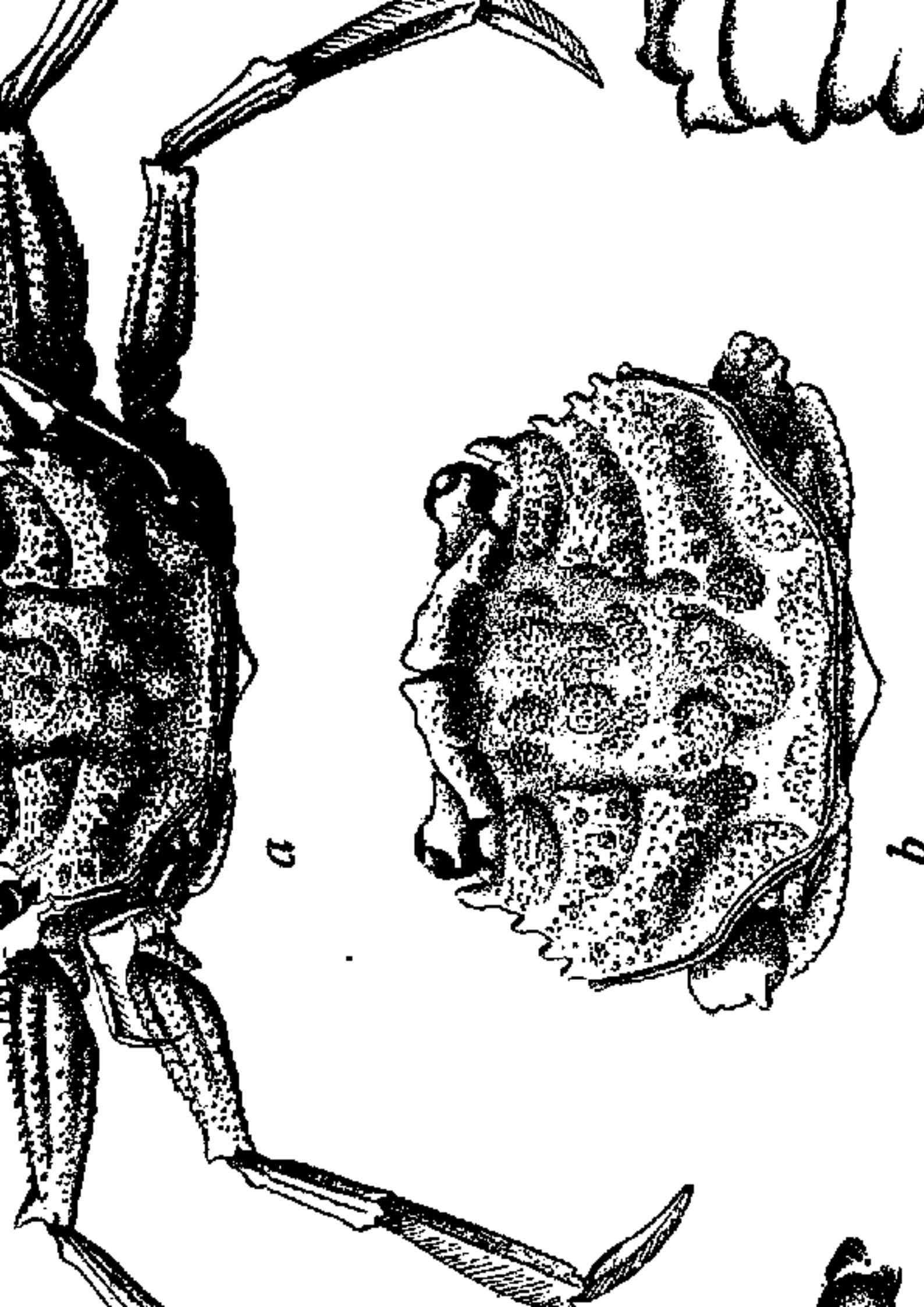


FIG. 126.—*Cymopolia tuberculata*, male, \times 2.

Barbados, 82 fathoms, station 295 (by error, 245), B
Paris Mus.).

agnosis.—Abdomen and sternum showing prominent carapace in dorsal view. Three subequal antennae; suborbital lobe trilobed, inner sinus large. Chelicerae one-third wider than long; a sinuous process.



preserved specimens.)

Measurements.—Male (49149), greatest length of same 8.4, length of second leg 13.6 mm. *Female*, greatest length of carapace 9.8, width of second leg 23.4 mm.

Habitat.—From Gulf of Mexico to Florida Keys; 15 to 125 fathoms.

Material examined.—See page 211.

CYMOPOLIA ANGUSTA (Rathbun).

Cymopolia sica A. MILNE EDWARDS, Bull. Mus. Comp. Zool. 29 (part: one specimen from Santa Cruz).

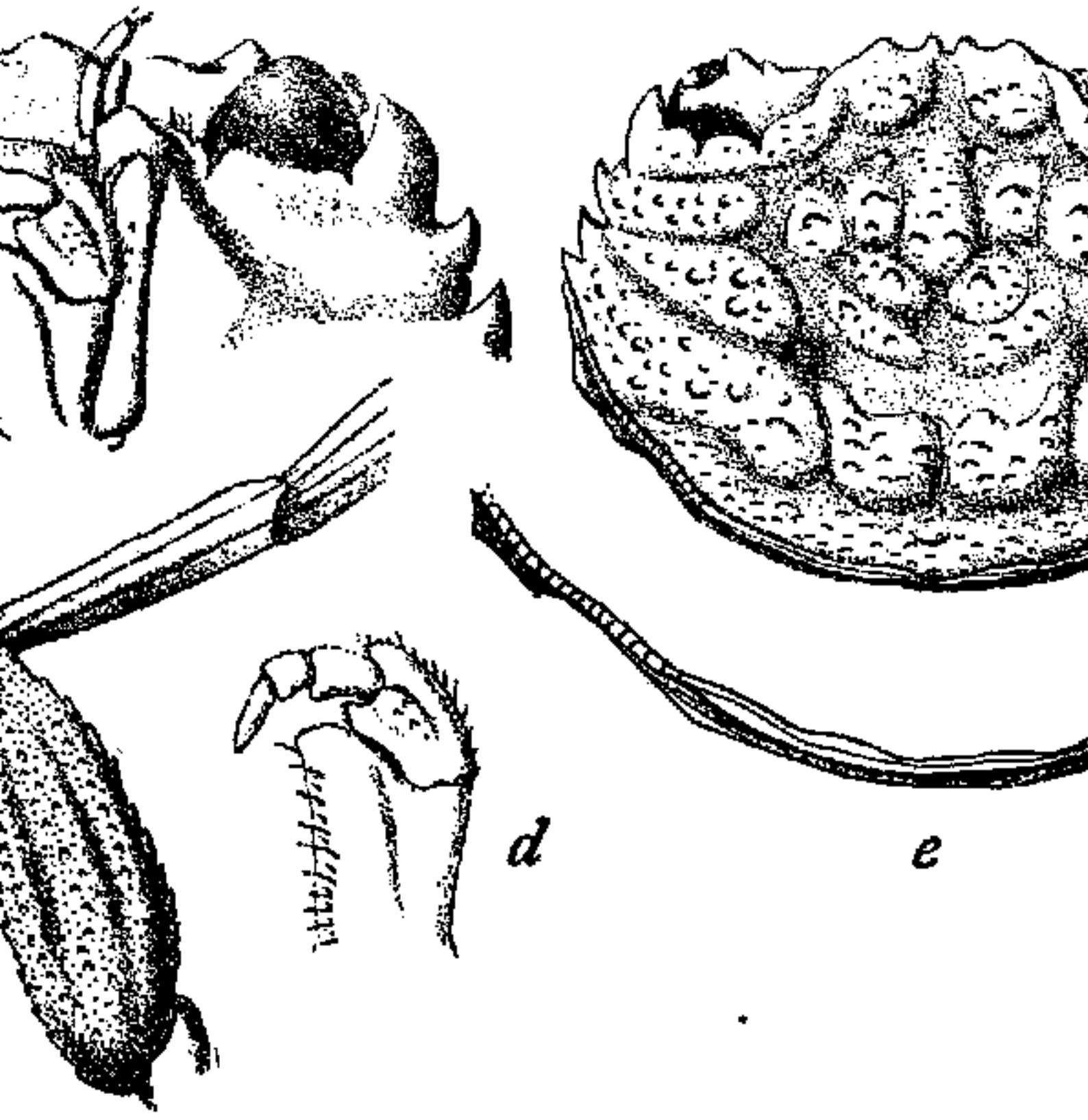
Cymopolia angustus RATHBUN, Proc. Biol. Soc. Washington 97 (type-locality, off Santa Cruz, 117 fathoms, station Blake; holotype, Cat. No. 2930, M.C.Z.).

Diagnosis.—Carapace narrow, one-seventh wider than posterior line of tubercles; three subequal tubercles above posterior margin less uneven; middle tubercle narrower; ischium of maxilliped much wider; chela short and very broad in middle; median portion

Description.—Closely allied to *C. sica*, differs as follows: Carapace narrower, ratio of length to width of carapace at 1:1.25 (smaller) to 1.39 (larger) in *sica*; tubercles above posterior margin less uneven; middle tubercle narrower; ischium of maxilliped much wider; chela short and very broad in middle; median portion

* One is holotype designated by A. Mine Edward

Not 243.



—*CYMOPOlia DEPRESSA*, YOUNG FEMALE (6505, M. C. Z.)
DS AND BOUVIER. a, LEFT OCULO-ANTENNAL REGION, VENT.
APACE; b, DORSAL VIEW, $\times 8\frac{1}{2}$; c, MERUS AND CARPUS OF SECON.
 $\times 11$; d, ENDOGNATH OF LEFT OUTER MAXILLIPED, $\times 18$; e, CAR.
ACE, ENLARGED.

three thin, subequal, antero-lateral teeth. The carapace showing prominent laminae behind carapace and suborbital lobe twilobed; inner sinus small. The

greatest length of carapace 7, width 9.4, length of second leg 18.7 mm. length to width varies from 1:1.26 to

Range.—Lesser Antilles; 56 to 138

Material examined.—See table.

CYMOPOLIA FRAGILIS Rathbun.

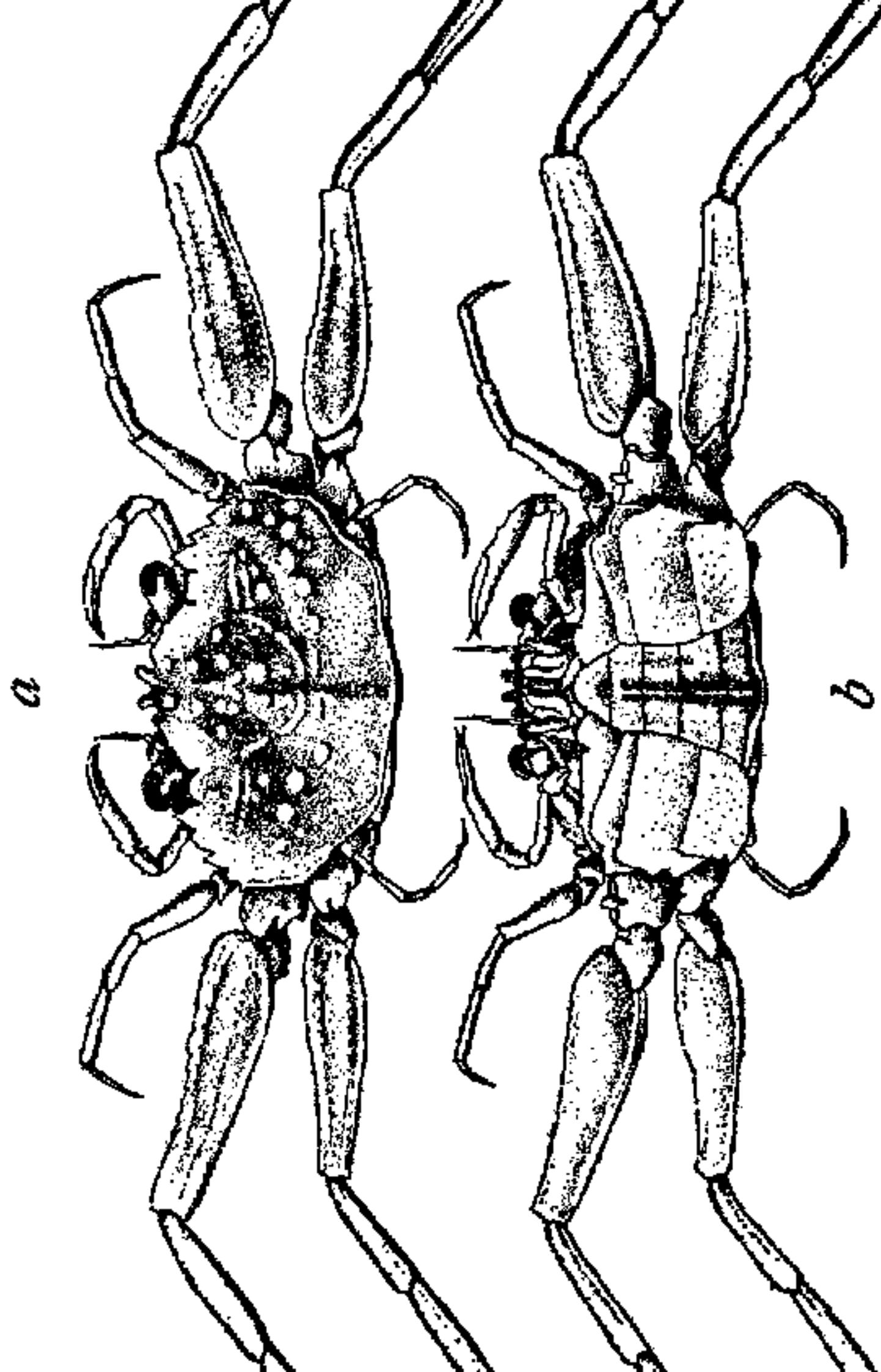
Plate 51, figs. 2 and 3.

Cymopolia fragilis RATHBUN, Proc. U.

Mus., vol. 16, 1893, p. 259 (type off Lower California, 58 and 71 stations 2983 and 3011, *Albatross*; Cat. No. 17485, U.S.N.M.).—FAX Mus. Comp. Zoöl., vol. 18, 1895, p. figs. 4, 4a.

Diagnosis.—Four subequal anterior teeth. Carapace half again as wide. First ambulatory not reaching beyond of second.

Description.—Carapace very broad, very convex, with four thin-edged lateral teeth besides orbital tooth. Trace of carapace very well marked, high, forward, and definitely placed (see fig.). Intervening space scantily filled with inconspicuous granules and short hair.



ous posterior margin.

Measurements.—Male holotype, length of carapace 8.5, width of sa length of second leg 25.5 mm.

Range.—Lower California to Ecu to 71 fathoms.

Material examined.—See table.

Remarks.—There is no Atlantic p of this species known.

CYMOPOLIA CURSOR A. Milne Edwards

Plate 52, figs. 1 and 2.

Cymopolia cursor A. MILNE EDWARDS,

Comp. Zoöl., vol. 8, 1880, p. 29 (t

ties, Sand Key, Havana, St. Kli
nique, Barbades, 138–245 fathoms)

Proc. U. S. Nat. Mus., vol. 6, 1883

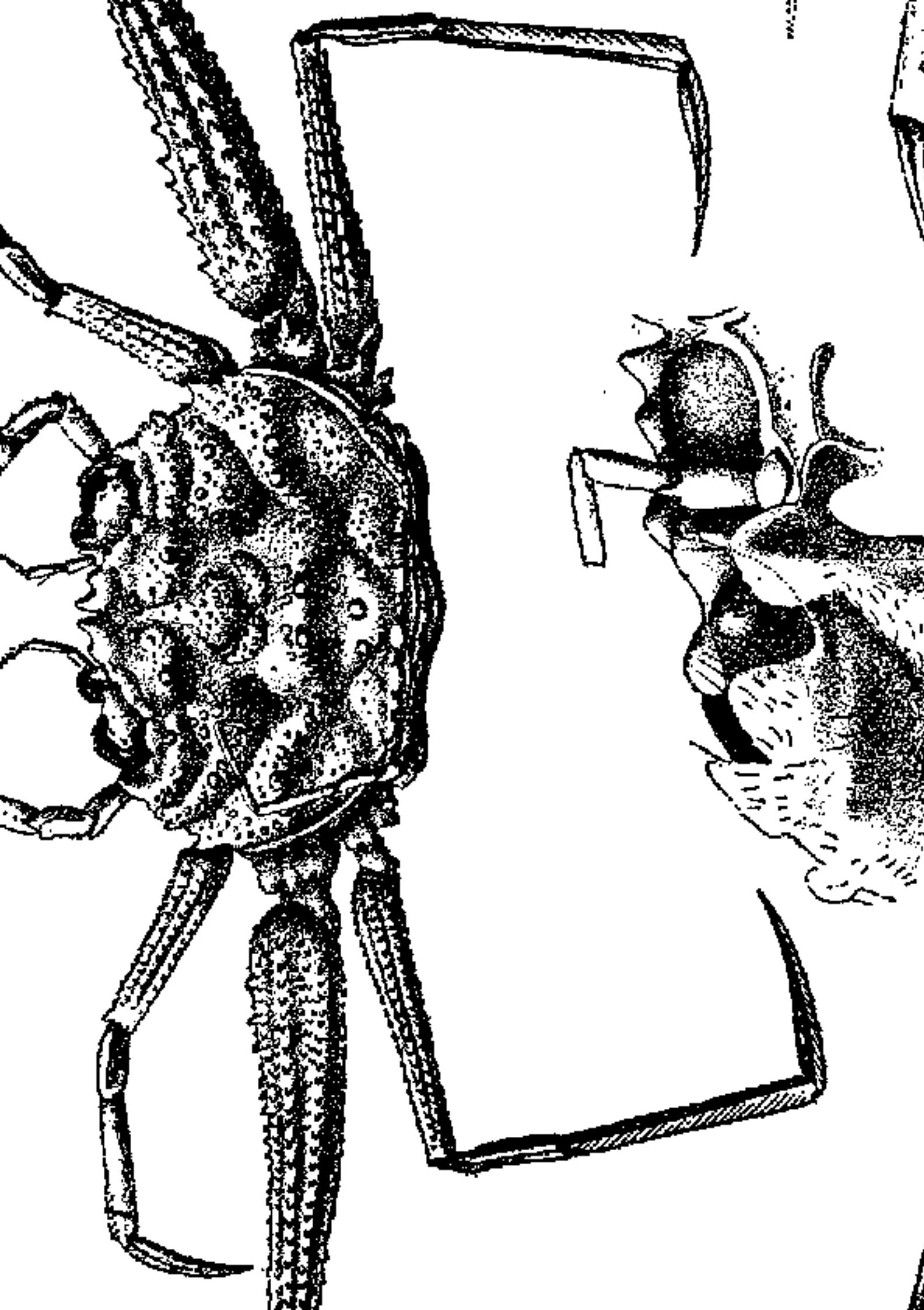
Cymopolia dilatata A. MILNE EDWA

Mus. Comp. Zoöl., vol. 8, 1880, p.
locality, St. Kitts, 208 fathoms;

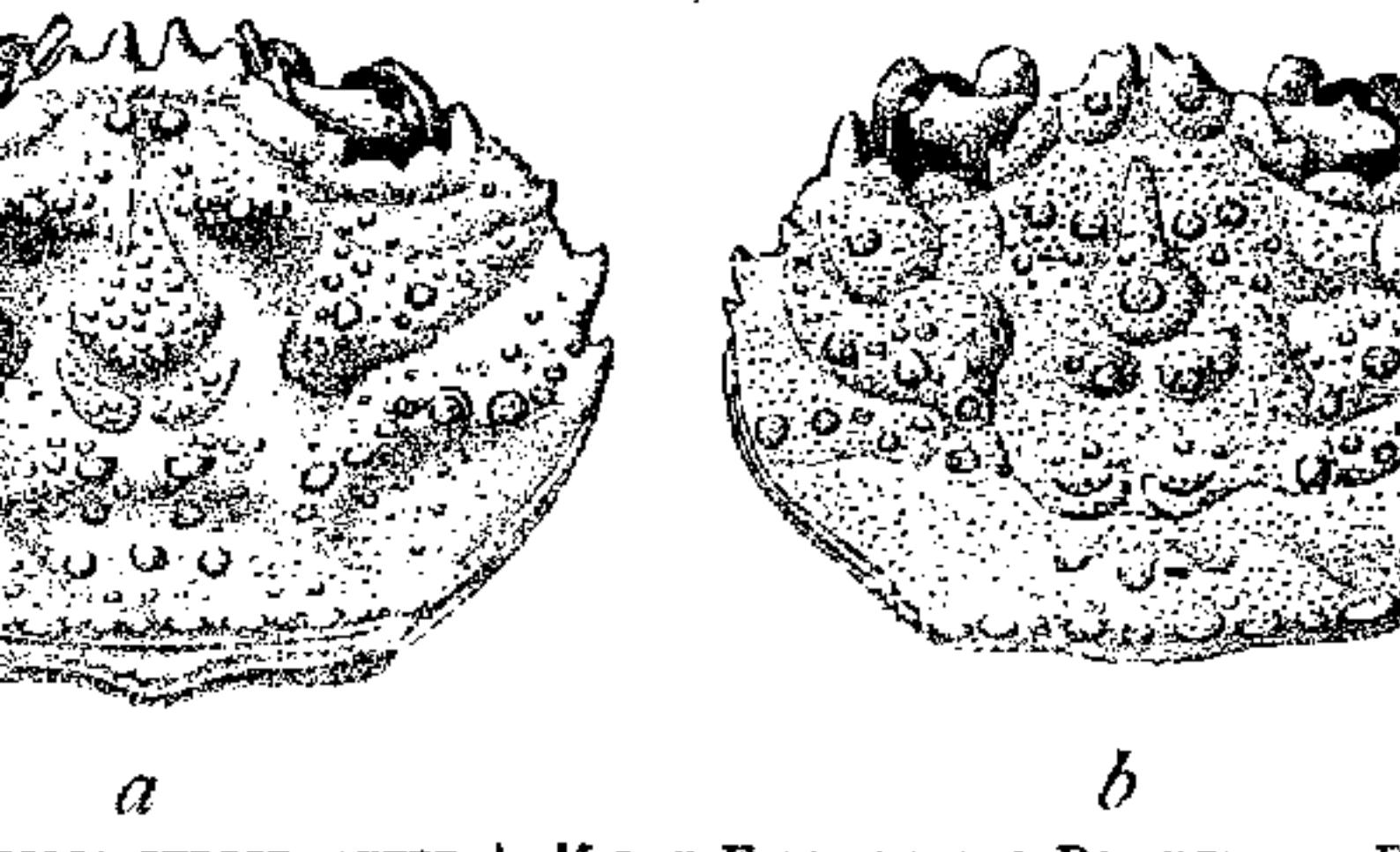
6496, M. C. Z.).

Palicus cursor RATHBUN, Proc. Biol. S
ington, vol. 11, 1897, p. 95.—

EDWARDS and BOUVIER, Mem. M
Zoöl., vol. 27, 1902, p. 64, pl. 12,
(not 14),¹ (female, Barbados,
fathoms, Blake station 274, se
type; Cat. No. 6495, M.C.Z.).



margin straight, formed of six or more round lobes intervening. Lobes of suborbital margin very narrow, with blunt extremity; sinuses broadly V-



POLIA CURSOR, AFTER A. MILNE EDWARDS AND BOUVIER. *a*, LATERAL VIEW OF HEAD OF FEMALE SHOWN IN FIG. 130, $\times 3\frac{1}{2}$; *b*, SAME VIEW OF FEMALE, $\times 4$.

rounded at base. Pterygostomian lobe large, restricted at base, covering all of the inner suborbital lobe, in ventral view.

Slender in both sexes.

Walking legs the second is very much longer than the third; the first reaches a little beyond end of the third a little beyond the carpus of second, second is as long as width of carapace: merus joints longer

Barbados; 107 to 2

Material examined

CYMOPOLIA GRACILIS

Plate 50; plate

Cymopolia gracilis

U. S. Nat M

p. 20 (type-loc

thas Vineyard

142 fathoms

Fish Hawk;

U.S.N.M.).

Palicus gracilis

Biol. Soc. Was

1897, p. 95.

Diagnosis.—One
Second leg three
times as long as w
pace. Inner suborb
form, not visible fr

Description.—Ne

Carapace more con
ro-lateral margins
Front narrower p
upper margin of o
wider; frontal teeth
shorter, the sinuses
and the median te

* Type of *C. dilatata*.

Albatross	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.
W. Sim.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.
Blake	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.
Albatross	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.
Blake	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.
2601	55	2133	146	148	192	291	291	274	274	281	do.								
Oct.	18. 1885	Feb. 27, 1884	Jan. 14, 1879	do.	Jan. 30, 1879	Mar. 9, 1879	Mar. 5, 1879	do.											
Mar.	14, 1885	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.
*F.	52	551	631	491	491	531	531	531	531	531	do.								
gy. S. P.	wh. S. brk. Sh.	the gy. S. Oz.	the gy. S. blk. Sp.	the gy. S. M.	ers. S.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.
gn. M. brk. Sh.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.	do.
107	290	205	208	138	210	210	209	209	209	258	do.								
142	290	205	208	138	210	210	209	209	209	258	do.								
128	290	205	208	138	210	210	209	209	209	258	do.								
" 30	30	30	30	30	30	30	30	30	30	30	do.								
- 33	52	21	48	51	46	21	41	41	36	36	36	36	36	36	36	36	36	36	36
* 45	65	62	62	61	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59
" 15	30	30	55	55	32	20	20	20	20	20	20	20	20	20	20	20	20	20	20
" 39	38	38	55	55	22	17	17	12	12	12	12	12	12	12	12	12	12	12	12
* 34	28	23	19	17	17	15	13	13	13	13	13	13	13	13	13	13	13	13	12

* Type *C. dilatata*.

antenna; outer sinus of low triangular.

The first leg reaches to merus of second, the third to carpus of second, second about one-half times as long as carapace; merus joints more



FIG. 132.—*CYMOPOLIA GRACILIS*,
FRONT AND ORBITS OF FEMALE (114).

cal than in *cursor* and with margin almost unarmed except distal end; carpal joints cylindrically flattened and angled.

Crest of fifth abdominal segment of female obsolescent; first two segments of male abdomen cristate, last segment with side margins obliquely angled.

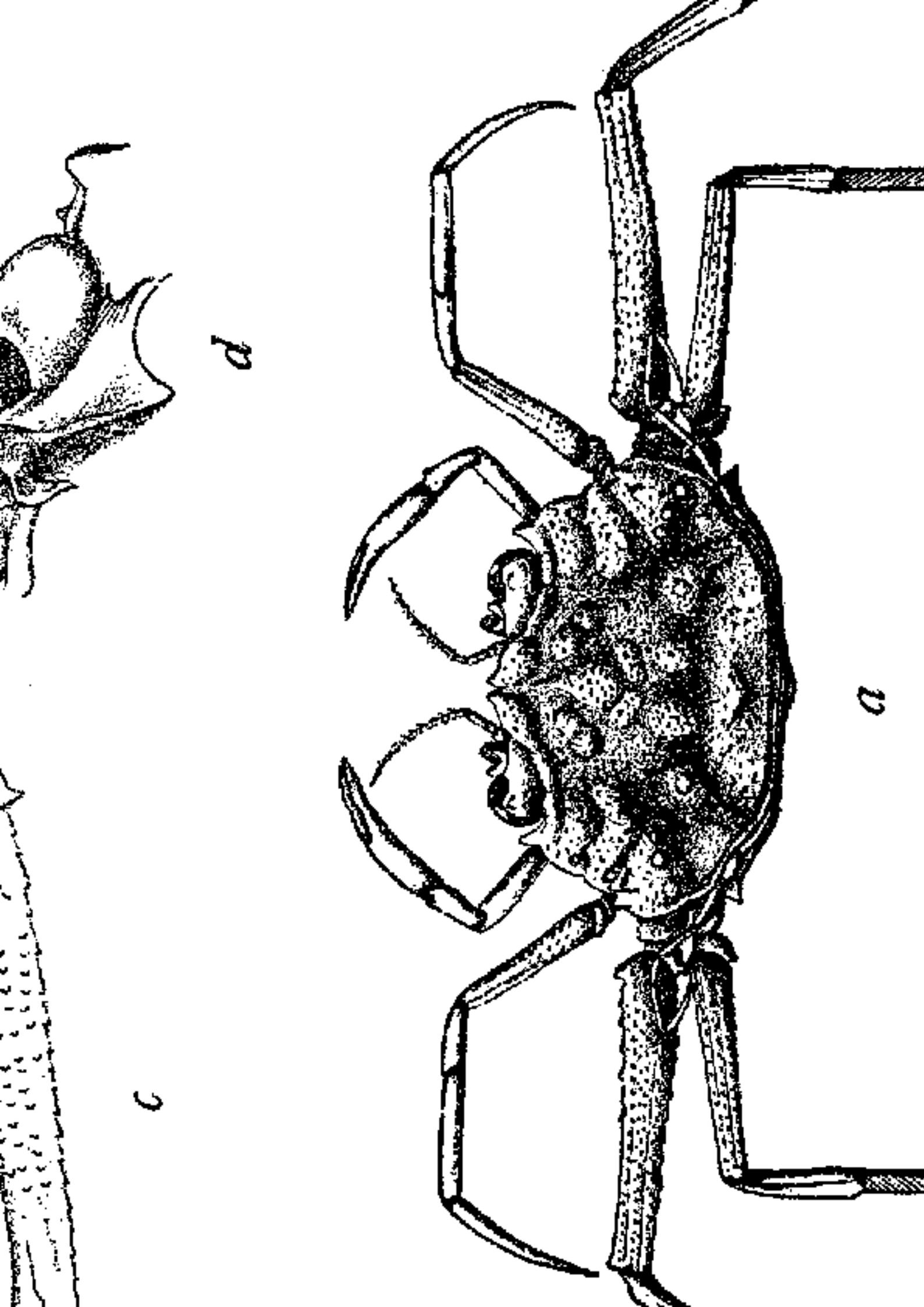
Measurements. — Female length of carapace 10.6, width

angle of the buccal cavity.

Aprior.—Near *C. cursor* and *C. gracilis*, but the quadrate, the postero-lateral margins being more nearly at right angles, the lateral margins of the carapace distinct from one another; about 20 tubercles are large and are arranged in a triangle on the mesogastric region; 2 cardiac, small; 4 in a row above the posterior margin of the basal region, of which 4 form a rhomb near the cardiac region. Four acute teeth on each side of middle pair slender, separated by a deep sinus. Outer orbital tooth narrow, pointing nearly at right angles to the outer angle of preorbital tooth; those in front of the orbit are subtriangular, the outer one the largest, other sinuses V-shaped. Three anterior teeth sharp, rather spiniform, the hepatic tooth a little larger than the branchial teeth; the next tooth than the branchial teeth are from the orbit produced obliquely inward in a small process hidden by the large, lobiform, subacute, pointed tooth. First peduncular segment of antenna armed with spines nearly as advanced as the middle spines of the first leg, slender. The propodus of the first leg reaches the second, the merus of second leg reaches a little past the propodus of the third. Second leg about three times as long as broad, the width of carapace. Merus joints of first three legs

Second leg between two and one-half and three and one-half times as long as broad; space between legs about equal to width of carapace. Inner suborbital lobe prominent, bilobed, with two small tubercles; outer lobe with two small tubercles; two large tubercles on third segment and one on fourth segment.

Carapace very wide behind, ornamented with tubercles; the most prominent are the two large ones, side by side, separated by a deep furrow, and smaller tubercles on the posterior branchial area granulated. Fronto-orbital margin less deeply cut than in any other species; median sinus singular, median teeth tuberculiform, lateral lobes of exorbital lobe little developed, concealing but not covering the sinus. Supra-orbital lobes very shallow, rounded, as outer, inner and middle sinuses V-shaped, outer tooth of orbit very short, not reaching the sinus; only one antero-lateral tooth and that on the left; in front of widest part of carapace; tooth thickened behind it a groove runs parallel to postero-lateral lobe of suborbital margin shallow, triangular, bounded by exorbital tooth by a broad, shallow sinus, which from the long inner lobe, which has a sinus at the extremity is divided into two subequal lobes above, the inner lobe more advanced and on the right; rounded pterygostomian lobe does not cover the outer portion of the inner orbital lobe.



Palicus acutifrons RATHBUN, P.
Soc. Washington, vol. 11, 1897
A. MILNE EDWARDS and BOUVIER
Mus. Comp. Zoöl., vol. 27, 1900
pl. 12, figs. 1-5.

Diagnosis.—Carapace covered with numerous fine granules. Middle of front with narrow elongate tip of antero-lateral tooth. Inner suborbital tooth not exceeding pterygostomus. Chelipeds tuberculous.

Description of immature female.—Carapace everywhere covered with contiguous granules among which are some larger, more elevated granules. Like *C. gracilipes*, there is only one antero-lateral tooth, and in the same position but smaller. Median sinus deep, triangular, median lobes very narrow or bluntly spiniform at extremities; at their outer base, a tubercle. Suborbital lobes small, triangular, separated by rounded sinuses. Outer lobe short, not reaching middle of eye. Outer suborbital lobe low, broad, triangular, ending in a sharp point.

¹ Female is type figured by A. Milne Edwards and Bouvier, 1902.



134.—*Cymopolia acutifrons*, FEMALE HOLOTYPE, AFTER A. M. D. BOUVIER. *a*, RIGHT FRONTAL BORDER, $\times 15$ (EDGE BETWEEN ORBIT BROKEN); *b*, RIGHT OUTER ORBITAL ANGLE AND ADJOINING INFRA-ORBITAL BORDER, $\times 15$; *c*, MEDIAN PART OF FRONTAL BORDER OF PTERYGOSTOMIAL LOBE AND CONTIGUOUS ANTENNAL PEDUNCLE, $\times 15$; *d*, RIGHT EYE, FROM ABOVE, $\times 15$.

Family GRAPSIDAE Dana.

psoidiens MILNE EDWARDS, Hist. Nat. Crust., vol. 2, 1835; *psidae* DANA, Amer. Journ. Sci., ser. 2, vol. 12, 1851, p. 129; *Grapsidae* ALCOCK, Journ. Asiat. Soc. Bengal, vol. 13, Crust., pt. 1, 1852, p. 329.—ALCOCK, Journ. Asiat. Soc. Bengal, vol. 69, 1900, pp. 283, 288, and 295, and synonymized. The palp of the external maxillipeds articulates near the external angle or at the middle of the anterior margin of the exognath either very slender or very broad. If the exognath is very broad the division of the orbit into two lobes is well marked.

- rior surface of orbit concave.
- ennae excluded from the orbit-----*Goniopsis*,
ennae entering the orbit.
- arapace depressed, distinctly striated---*Pachygrapsus*
arapace convex, almost smooth-----*Planes*,
- rior surface of orbit bulging outward----*Grapsodius*,
border of the orbit does not run downward toward
cavern, but is supplemented by a rather distant sulcus
which is in line with the anterior border of the epistome.
- Subfamily *Varuninae*
- egment of male abdomen not entirely covering the sternum
een the legs of the last pair.
- o-lateral margins arcuate. Merus of external maxilliped
ad as long.
- face very uneven. Front strongly advanced. Submerist not forming a stridulating ridge----*Cyrtograpsus*
face little uneven. Front moderately advanced. Submerist a stridulating ridge which scrapes against a sharp
usually horny ridge on the distal end of the arm.
- Hemigrapsus*,
- al margins straight and parallel. Merus of external maxilliped
is longer than broad-----*Tetragrapsus*,
egment of male abdomen covering the sternum between the legs of the last pair.
- odus of large cheliped normal.
- arapace subrotund-----*Glyptograpsus*,
arapace squarish-----*Euchirograpsus*,
odus of large cheliped prolonged proximally far beyond the articulation with the carpus-----*Platychirograpsus*.

- the antennules are visible in dorsal view in deep crevices
the carapace-----Subfamily
Carapace broader than long-----
Carapace longer than broad-----

Subfamily GRAPSINAE Dana (part)

Grapsacea MILNE EDWARDS, Ann. Sci. Nat., ser. 3, Zool., [129] (part).

Grapsinae DANA, Amer. Journ. Sci., ser. 2, vol. 12, 1851, Exped., vol. 13, Crust., pt. 1, 1852, p. 331 (part).—An Soc. Bengal, vol. 69, 1900, pp. 288 and 295.

Joint usually strongly deflexed. The lower border downward toward the buccal cavern. Antennae

The external maxillipeds leave usually a wide space between them, and are not traversed by an oblique suture; the palp articulates at or near the antero-external angle; the exognath is narrow and exposed through the mouth; the maxillary palp often fills all the space between the last pair of legs.

Genus GRAPSUS Lamarck.

Grapsus LAMARCK, Sys. Anim. sans Vert., 1801, p. 150.
Latreille=*G. grapsus* (Linnaeus).

Orthograpsus (part) KINGSLEY, Proc. Acad. Nat. Sci. Philadelphia, p. 194.

Oniopsis (part) DE HAAN, Fauna Japon., Crust., 1833, p. 100.
Carapace little broader than long, much depressed, with well-defined branchial groove very clear; branchial

the orbital margin. Buccal cavity square with the antero-corners rounded off. External maxillipeds widely separated from the ovoidal gap in which the mandibles are exposed; ischium of the merus narrow, the latter slightly the shorter; and the palp, which is coarse, especially as to its carpus, articulates near the antero-angle of the merus.

Legs subequal, much shorter than the legs, but in the male longer; hands and fingers short and stout, tips of fingers broad and bowed in a spoon.

Abdomen broad and compressed, especially the merus; dorsal surface of the joints has a striated or squamiform sculpture; dactyli

men with seven segments in both sexes; in the male its base broad as the sternum between the last pair of legs.

Found on rocks and reefs of all tropical and subtropical seas.

GRAPSUS GRAPSUS (Linnaeus).

ROCK CRAB; SALLY LIGHTFOOT.

Plates 53 and 54.

Grapsus maculatus CATESBY, Nat. Hist. Carolina, Florida, and the Bahama Islands, vol. 2, 1743, p. 36, pl. 36, fig. 1, "inhabit the rocks overhanging the sea."

Grapsus grapsus LINNAEUS, Sys. Nat., ed. 10, vol. 1, 1758, p. 630 (type-localities, America and Ascension Island; types not extant).

Grapsus pictus LATREILLE, Hist. Nat. Crust., vol. 6, an XI (1802-1803), p. 69 (type-locality, les îles de l'Amérique méridionale; type in Paris Mus.).

Grapsus webbi MILNE EDWARDS, Ann. Sci. Nat., ser. 3, Zool., vol. 20, 1853, p. 16.

Grapsus (Goniopsis) pictus DE HAAN, Fauna Japon., Crust., 1835, p. 33.

Grapsus maculatus MILNE EDWARDS, Ann. Sci. Nat., ser. 3, Zool., vol. 20, 1853, p. 167 [133], pl. 6, figs. 1-1 n (type-locality, Antilles; type in Paris Mus.).

Grapsus webbi MILNE EDWARDS, Ann. Sci. Nat., ser. 3, Zool., vol. 20, 1853, p. 167 [133] (type-locality, Canary Islands; type in Paris Mus.).

Grapsus ornatus MILNE EDWARDS, Ann. Sci. Nat., ser. 3, Zool., vol. 20,

Length of epistome about one-third its greatest breadth.

inner angle of orbit subovate.

Chelipeds in male about as long as carapace, shorter female; inner border of ischium and arm strongly spinous half of outer border of arm less deeply spined; wrist watered tubercles on its upper surface and with its inner produced in an ovate, falcate tooth with a short spiniform tip nearly as high as long, its outer surface sculptured, its border culminating in a tooth; fingers with very broad tips; length of dactylus in male nearly twice the length of the

border of the palm.

First pair of legs shortest, fourth pair longest, fifth and third pair longest, about twice as long as the first. Only in the last pair of legs does the breadth of the merus approach half its length. The distal end of the upper border of each merus bears a spine, while the same end of the lower border of the first three pairs is armed with two or three small spines.

Measurements.—Male (16032), length of carapace 77, width of same 87 mm.

Color.—Usually variegated with deep red and light greenish-yellow (seen in alcohol). Chelae an even, brilliant red. Sometimes the body and legs are entirely red without mottlings.

Habits.—According to Catesby, "these crabs inhabit the rocks overhanging the sea; they are the nimblest of all other crabs, and run with surprising agility along the upright side of a rock under rocks that hang horizontally over the sea; this they are obliged to do for escaping the assaults of rapacious birds which pursue them. These crabs, so far as I could observe, never leave the land, but frequent mostly those parts of the promontories and islands of rocks in and near the sea, where by the continual and violent agitation of the waves against the rocks they are always continually receiving the spray of the sea, which often washes them off it, but they instantly return to the rock again, not being able to remain long on the land."

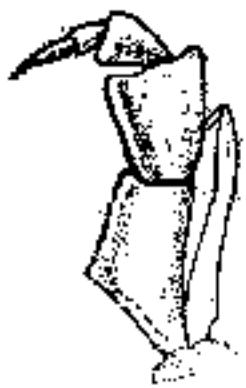


FIG. 135.—*GRAPSUS GRAPSUS*, OUTER MAXILLIPED, ENLARGED. (AFTER MILNE EDWARDS.)

, Bahamas; 1886; *Albatross*; 4 males, 6 fe
amas; 1886; *Albatross*; 3 males (11365).
n; on coral reef, above water; May 31, 1900; W.
I. Riley; 1 female (23806).
Henderson and Bartsch, *Tomas Barrera* Exped.
at between Cayo Hutia and Little Cayo, northw.
20; 1 young male (48575).
de Cajon, off Cape San Antonio; May 22; 2 fe
7).
on; 1 male (48601).
t; *Albatross*; 1 male (7334).
, Jamaica; rocky ledges along shore; called "B.
B. Wilson; 1 male (42880).
; C. F. Baker; 1 female (22559).
Fish Hawk:
; Jan. 4, 1899; 1 female, shedding (24054). J
9; 1 male, 1 female (24061).
a; Jan. 18, 1899; 11 y. (24053).
Bay; Jan. 28, 1899; 1 female (24052).
Bay; Jan. 28, 1899; 1 male, 1 female (24056).
Ponce; Jan. 30 and 31, 1899; 11 males, 7 fe

Ponce Reef; Feb. 1, 1899; 2 males (24059).
Ponce Lighthouse; Jan. 31, 1899; 3 males, 2 fe

- ernando Noronha, Brazil; 1876-1877; R. Rathbun; 3 males, 2 females, 4 y. (40587).
- Hungry Bay, Bermudas; July-Sept.; F. G. C. (1486).
- Cape Verde Islands; U. S. Exploring Exped.; 1 female.
- Porto Grande, St. Vincent, Cape Verde Islands; W. H. Brown, U. S. Eclipse Exped. to Africa; 1 y. (1486).
- Azores; William Trelease; 3 males, 3 females (1866).
- Porto de la Vila, Fayal, Azores; Nov. 2, 1889; W. H. Brown, U. S. Eclipse Exped. to Africa; 1 female (14867).
- Porto de la Vila, Fayal, Azores; beach at low tide in 1889; Lewis Dexter; 1 female (17600).
- Ascension Island; Mar. 20, 1890; W. H. Brown, U. S. Eclipse Exped. to Africa; 4 males, 4 females (14868).
- Playa Benito Island, Lower California, Mexico; W. T. Anthony; 1 male (20686).
- South end Cedros Island, Lower California; April 1890; 3 specimens (43851).
- Playa Roque Island, Lower California; Apr. 1890; W. T. Anthony; 1 male (20685).
- Playa Union Island, Lower California; Apr. 16, 1897; 2 males, 3 females (20687).
- Playa Magdalena Bay, Lower California; Apr. 8, 1897; 1 male (15524).

land; Apr. 7, 1888; *Albatross*; 5 males, 4 ♀
Island; Apr. 10, 1888; *Albatross*; 3 ma-
. (22088).

land; Apr. 11, 1888; *Albatross*; 6 males, 1 y. (2
gable Island; Apr. 12, 1888; *Albatross*; 2 ma-
2085).

Island; Apr. 13, 1888; *Albatross*; 3 males, 3 ♀

(?); U. S. Expl. Exped.; 1 female (2344).

llao water front; from rocks in and above the
R. E. Coker; received from Peruvian Governm-
436).

Island, Peru; Jan., 1884; Dr. W. H. Jones,
13865).

ands, Peru; July 13; R. E. Coker; received from
nt; 1 male (40437).

ru; July 25, 1908; R. E. Coker; received from
nt; 1 female (40438).

granosus (Herbst) is recorded from Loretto,
hite (List Crust. Brit. Mus., 1847, p. 40), un-
s strigosus. This is probably *Grapsus grapsus*.

Genus GEOGRAPSUS Stimpson.

ograpsus lividus STIMPSON, Ann. Lyc. Nat. Hist. New p. 230.

ograpsus occidentalis STIMPSON, Ann. Lyc. Nat. Hist. 1860, p. 230 (type-locality, Cape St. Lucas; cotype Zoöl.).

thograpsus hillii KINGSLEY, Proc. Acad. Nat. Sci. p. 194 (type-localities, West Indies; type in Mus. and Key West, Fla.).

gnosis.—Lateral margin well defined through little deflexed. Fingers pointed.

cription.—Carapace subquadrilateral, widening, lateral borders well defined, and posteriorly surface nearly to its middle by a sinuous line border. Transverse markings fine, obsolescent, absent on the cardiac region.

four tubercles along the upper border of the vent; edge of front in dorsal view nearly straight at the middle. Notch near outer end of deep.

claspers in both sexes a little unequal; about one length of carapace, covered with transversal uniform striae; upper surface of last three joints margin of arm expanded, proximally denticulated teeth; an acute tooth or spine at inner angle greatest breadth of the merus joints of the legs their length. First pair of legs slightly shorter

Dr. T. H. Morgan; 3 males, 1 female (14223).
1899; *Fish Hawk*:
Seal; Jan. 26; 2 males (24042).
Ponce; Jan. 30; 7 males, 3 females (24041).
Feb. 13; 2 females (24044).
Honda, Culebra; Feb. 9-10; 5 males, 2 fe-

d, Porto Rico; Mar. 28, 1900; L. Stejneger; 1 m-

West Indies: Jan. 17-24, 1884; *Albatross*; 3 f-
e near town; June 28, 1915; C. R. Shoemaker;
shore of harbor; July 6, 1915; C. R. Shoema-
rovig. (49807). A. H. Riise; 1 female (2465).
s, St. Lucia, West Indies; Dec. 2, 1887; *Alb-*

1, Trinidad; shore; Jan. 30-Feb. 2, 1884; *Alb-*

raçao; one-half fathom; Mar. 6, 1905; J. J.

Columbia; 1884; *Albatross*; 9 males, 18 females (4624).
ce, West Indies; Apr. 4-9, 1881; *Albatross*; 3 fe-

Paulo, Brazil; 1901; R. Krone; 1 male (4785).
er California; L. Belding; 3 females (4623).
Bay, Lower California; Mar. 27, 1911; *Albat-*
4581).

ovable segment of the antenna. Episome scarcely not nearly reaching the orbit. Merus of one and broader than the ischium, and as broad as the chelipeds in the male much stouter than the legs. Claws produced out in shallow spoons.
contains only one species.

LEPTOGRAPSUS VARIEGATUS (Fabricius).

Plate 56.

Leptograpsus variegatus FABRICIUS, Entom. Syst., vol. 2, 1787 [1794], p. 179 (type-locality, *in Americae meridionalis Insulis*; type not seen).
Leptograpsus variegatus LATREILLE, Hist. Nat. Crust., vol. 1, part 1, 1803, p. 71.

Leptograpsus personatus LAMARCK, Hist. Nat. Anim. sans Ven. et Poiss., vol. 1, part 1, 1804, p. 249 (type-locality, New Holland; type in Paris Muséum);
Leptograpsus strigilatus WHITE, in Gray, Zool. Miscellany, vol. 1, 1833, p. 10 (type-locality, New Zealand).

Leptograpsus planifrons DANA, Proc. Acad. Nat. Sci. Philadelphia, 1851, p. 249 (type-locality, *ad oras juxta urbem Valparaisi*, Chile; type in U.S.N.M.); U. S. Expl. Exped., vol. 13, Crust., 1852, p. 2343, pl. 21, figs. 3a-3e.

Leptograpsus variegatus MILNE EDWARDS, Ann. Sci. Nat., Zoöl., 20, 1853, p. 171 [137].

Leptograpsus verreauxi MILNE EDWARDS, Ann. Sci. Nat., Zoöl., 20, 1853, p. 171 [137], (type-locality, *Australie*; type in U.S.N.M.).

Leptograpsus ansoni MILNE EDWARDS, Ann. Sci. Nat., ser. 3, Zoöl., 20, 1853, p. 171 [137], (type-locality, *Ile de Juan-Fernandez*, Chile; type in U.S.N.M.).—DE MAN, Notes Leyden Mus., vol. 12, 1890, p. 10.

similar large tooth just distal to that on the
tibia in male a little more than one and one-half
upper border of palm.

Legs shortest, third pair longest, about twice
Merus of last pair twice as long as broad, m
ger. A spine at distal end of upper border
two or three small spines or teeth at distal end o
ve in the last pair.

A variable species. Individuals differ in w
egs, in the curvature of the side margins and
in the prominence of the frontal lobules and of t
region, and of the sculptural lines.

able. Red and yellow mixed, or dotted with
nes whitish. "Bluish-gray, everywhere trans
notched with black; feet often reddish" (Stim
ts.—Male (2129), length of carapace 54.8, w

m Peru to Chile; Juan Fernandez. Perna
Also Easter Island; Australia; New Zealand
hanghai (Heller).

mined.—

In Lorenzo, Peru; U. S. Expl. Exped.; 1 male
ands, Peru; specimens in Copenhagen Mus.
e; specimens in Copenhagen Mus.

Chile; Nov., 1914; Dr. J. N. Rose; 1 male, 1

nt about half the width of the carapace, verti
truncate and prominent.

Its of good width, at the corners of the carapac
two notches at outer end; the orbital hiatus is
ring to the inner of the orbital fossae, and ex
from the orbit. First movable joint of antenn
d lateral expansion. Antennules folded trans
stome well defined, small, deeply concave. Bucc
he anterior corners rounded. The outer maxi
nd separated by a very broad rhomboidal ga
bles are exposed. Merus and ischium subequal
palp articulates at the outer angle of the merus.
chelipeds unequal, much more massive than the
g as the third pair; fingers slightly hollowed at
s broad and compressed, especially the merus,
cheliped, bears transverse markings; last thre
i spinous.

In *Geograpsus* there is, between the coxae of
pairs of legs, a narrow fossa fringed with hair
anterior cavity.

The abdomen in both sexes is composed of seven
male covers the sternum between the last pair of
tains only two species, which are analogous spe
of the continent: *cruentata* (Atlantic); *pulchr*

ipes RANDALL, Journ. Acad. Nat. Sci. Philadelphia, 1850), p. 125 (type-locality, Surinam; type in Mus. Phila.

nicola WHITE, List Crust. Brit. Mus., 1847, p. 40.—SAUv. Phys. Hist. Nat. Genève, vol. 14, 1858, p. 30, pl.

HERKLOTS, Addit. Faunam Afr. Occ., 1851, p. 8, pl. 1 (type-locality, *prope Boutry*; type in Leyden Mus.).

cruentatus DANA, U. S. Expl. Exped., vol. 13, Crust. 42; atlas, 1855, pl. 21, fig. 7.

mentata RATHBUN, Bull. U. S. Fish Comm., vol. 20, fig. 1), p. 15, pl. 1 (colored).

Carapace quadrate, with one side tooth. Frontal lobe excluded from orbit. Fossa fringed with spines on second and third legs.

• red.

—Carapace widening a little on sides, a little curved, swollen above the cardiac and intestinal regions; between ridges very deep.

of frontal lobes a little higher than the latter pair. Surface of carapace, lower edge nearly straight, slightly projecting, crenulate. Chelipeds prominently

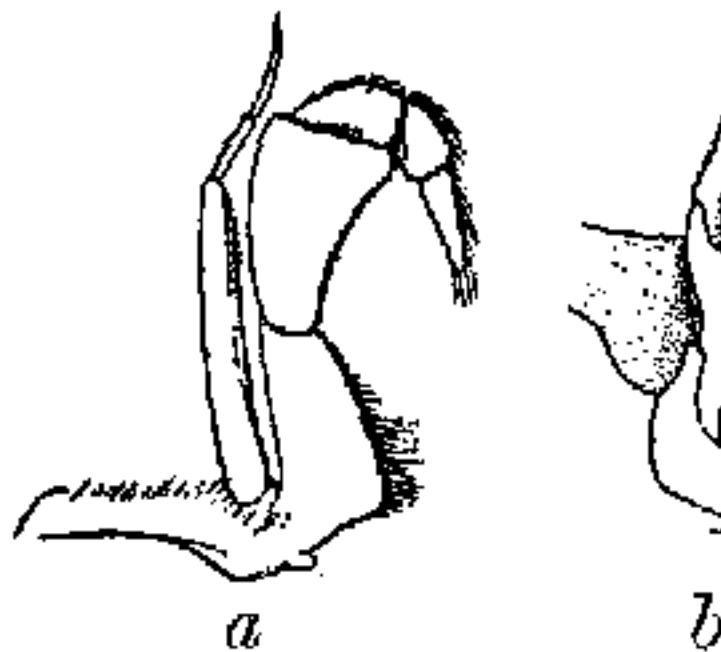


FIG. 136.—*GONIOPSIS CRUENTATA*.
a, OUTER MAXILLIPED, E. (AFTER MILNE EDWARD); b, LEFT FIRST APPENDAGE OF FEMALE (7677), SIDE. X 2.

ots and along the trunks of the trees and on wet
parts of the sea.

Range.—Bahamas and Gulf of Mexico to Province
of Pernambuco; Bermudas; West Africa.

Material examined.—

Gasacola, Florida; in fish stomach; Silas Stearns; Nassau, Bahamas: 1886; *Albatross*; 2 males, 1 female (25, 1898); *Fish Hawk*; 1 male, 1 y. (24064).

Spanish Wells, Bahamas; 1893; Biol. Exped. Stearns; male (Mus. S.U.I.).

Tampico, Mexico; “live in the soft mud of the marshes”; 1910; Edward Palmer; 1 male, 2 females (1910). San Pedro Belize, Honduras; W. A. Stanton; 1 male (1910). Providence, Caribbean Sea; Apr. 4–9, 1884; 1 male, 9 females (7542).

Curacao; Feb. 10–18, 1884; *Albatross*; 4 males, 3 females (1884). Matanzas, Cuba; in swamp; “climbs trees”; May 10, 1884; G. M. Allen and J. H. Riley; 1 male (23805).

Yucatan; 1914; Henderson and Bartsch, *Tomas Barreto*; 1 male (1914). Cozumel, Yucatan; May 20; 4 males, 4 females (2 ovig.) (4874). Cozumel, off Cape San Antonio; May 22; 3 males, 1 female (4875). Jamaica; Mar. 1–11, 1884; *Albatross*; 2 males, 1 female (1884). Falmouth, Jamaica; 1884; 1 male (4876). Montego Bay, Jamaica; P. W. Jarvis; 1 y. (4877). St. John’s; C. B. Wilson; 1 female (42882). June 1884; 1 female (42883). Salt Pond; June 1884; 1 female (42874). Salt Pond; June 1884; 2 females, 2 y. (41749).

nahe, Province of Rio de Janeiro, Brazil; Jan., 2 females (4783).

nce of São Paulo, Brazil; 1912; R. Krone; 1).

V. Hamlin; received from Wesleyan Univers

, Bermuda; July-Sept.; F. G. Gosling; 1

Africa; May 3, 1892; O. F. Cook; 1 male (213

Monrovia; Apr., 1894; O. F. Cook and G. N.
20574).

March, 1895; O. F. Cook; 2 males (21389).

esurado River, Monrovia; O. F. Cook; 1 f

Elmina, Ashantee; Nov. 27, 1889; W. H. E
xped. to Africa; 4 males, 2 females (14881).

GONIOPSIS PULCHRA (Lockington).

Plate 58.

pulcher LOCKINGTON, Proc. California Acad. Sci., vol. 152 [8], (type-locality, Magdalena Bay, west coast of ; type not extant).

mentatus KINGSLEY, Proc. Acad. Nat. Sci. Philadelphia (part: specimen from west coast of Nicaragua).—CAN

40, width of front 22.5 mm.



137.—*GONIOPSIS*
CHRA, ABDOMEN
MALE (12467),
1½.

Habits.—Like those of *G. crassipes*.

Range.—From Magdalena Bay, California, to Peru.

Material examined.—

Magdalena Island, Lower California, 1905; Nelson and Goldman, Biological Dept. Agriculture; 1 male (334).

Lower California (?); 1 male.

Guaymas, Mexico; gulf side stones, etc.; Feb. 23 and 27, 1890; 1 male, 1 female (17294), 1 male.

Boca del Jesus Maria, Cosala, 1905; P. Biolley and J. F. Triana; 1 male, 1 female (32284).

into Domingo, Gulf of Dolce, Costa Rica; April 1905; 1 male (19436).

as Vacas, near Capon, Peru; on beach; Jan. 1905; received from Peruvian Government; 3 males; *Induya*; common on muddy beaches; noted especially in grove swamps."

Genus PACHYGRAPSUS Randall.

Pachygrapsus RANDALL, Journ. Acad. Nat. Sci. Philadelphia (1840), p. 127; type, *P. crassipes* Randall.

Goniograpsus (part) DANA, Proc. Acad. Nat. Sci. Phila-

rs slightly grooved inside, forming shallow s
d and compressed, especially as to the meru
of the chelipeds, is transversely striated; the
ristly edges and the dactyli are thorny.
hen in both sexes has seven segments, and in
ernum at its base.

the Pacific and Atlantic coasts of America, th
ence eastward through the Mediterranean to t

TO THE AMERICAN SPECIES OF THE GENUS PACHYGRAPSUS.

with one or two side teeth behind the outer orbital tooth
with one side tooth.

end of posterior margin of merus of last pair of legs em
s of carapace strongly sinuous.....*crassipes*
s of carapace slightly sinuous.....*maurus*
end of posterior margin of merus of last pair of legs em
of front sinuous.....*transversus*
of front simply convex.....*gracilis*
with two side teeth.

of carapace naked.....*marmoratus*
of carapace hidden by short hairs.....*pubescens*
without side teeth.....*corrugatus*

CALOGOUS SPECIES ON OPPOSITE SIDES OF THE CONTINENT.

Atlantic.

Pacific.

maurus.

crassipes.

marmoratus.

pubescens.

s oblique, their major diameter less than one-third front, lower border denticulate.

Legs normally subequal, much heavier than the carapace and two-thirds times as long as the carapace, evenly striated, chela almost smooth. Inner margin of distal end of limb dentate. A subacute tooth on each finger. Hand about one and one-half times as high as wide, upper border margined, adjacent inner surfaces meeting at a sharp angle, lower part of outer surface traversed by an oblique raised line which runs from the end of the thumb to the tip of the index finger. Fingers narrowly and irregularly gaping. Dactyls one and one-half times as long as the upper margin of the hand. Claws one and one-half times as long as the fingers. Fig. 4. represents the legs in order of length, the longest and shortest being respectively one and one-half and one and two-thirds times as long as the fingers. The claws point with a spine near the distal end of the anterior pair and with a few teeth near the same end of the posterior pair.

Final segment of male abdomen triangular.

Color.—Dark crimson spotted with ecru.

Habitat.—A very common species on rocky shores.

Measurements.—Male (17455), length of carapace 20 mm.

Range.—From Oregon to Gulf of California; Galapagos Islands; also Japan and Korea.

Material examined.—

, California; *Albatross*; 1 male, 1 y. (17457), 3

ar San Diego, California; Aug., 1914; Mrs
cor; received from W. D. Webb; 1 female (490
California; 1880; D. S. Jordan; 5 males and

alifornia; W. H. Dall; 1 y. (17296).

n, Lower California, Mexico; L. Belding; 7
).

Island, W. of Lower California; Feb. 28, 1889
, 1 female (15567).

y, Lower California; May 3, 1888; *Albatross*;
455).

Island, Lower California; Mar. 19, 1911; *Alba*
579).

, Lower California; July 30, 1896; A. W. A
males (19509).

and, Gulf of California; Apr. 12, 1911; *Alba*
).

e, Albemarle Island, Galapagos Islands; 12 f
v.; 1 male (25663).

Islands"; probably error for California coas
Mus. Phila. Acad. Nat. Sci.

mi District, Japan; Mar., 1890; F. Sakamoto
from Garrett Droppers; 1 male, 1 female (1887

aygrapsus simplex STIMPSON, Proc. Acad. Nat. Sci. Phil.
1858, p. 102 [48].

aygrapsus maurus KINGSLEY, Proc. Acad. Nat. Sci. Phil.
p. 199.

nosis.—One side tooth. Striae mostly short.
re behind.

Description.—A small species. Carapace narrower than in *P. transversus*, with which this species has been less convergent behind, also less arched anteriorly; striae fine and much broken up, but present in the basal region.

of front bilobed, its surface granulate; supernumerary setae present.

end of wrist acute.

All angle of posterior border of merus of last pair of legs, and the first three pairs, dentate or denticulate.

Color.—Dark brown, with isolated yellow spots; some yellow hairs of the several joints of the legs.

Measurements.—Mature female (18627), length of carapace 10.5 mm. of same 7.8 mm. Male (Lucas), length of carapace 10.5 mm., width 19.5 mm.

Habitat.—Rio Janeiro (Dana, Heller); also East Atlantic; Madeira (Stimpson); Terceira, Azores (Lucas); Oran (M. Edwards).

Material examined.—Terceira, Azores; William Tracy's collection; Guia Island, Grand Canaries; September, 1862.

livifrons HELLER, Verh. k. k. zool.-bot. Ges., Wien, vol. 19, p. 167 (type-locality, Rio Janeiro; type in Vienna Mus.).

s intermedius HELLER, Crust. Reise Novara, 1865, p. 114 (type-locality, Rio Janeiro; type in Vienna Mus.).

s socius STIMPSON, Ann. Lyc. Nat. Hist. New York, 1857, p. 114 (type-localities, Peru, Panama, San Salvador, Madeira, Cape St. Lucas; cotypes from Cape St. Lucas and Pamp. Zoöl.).

s advena CATTA, Ann. Sci. Nat., ser. 6, Zool., vol. 3, 1855, p. 1 (type-locality, Marseille on vessel from Pondicherry to Cape of Good Hope; type probably not extant).

One side tooth. Sides strongly convergent. Inner edge of movable finger smooth. Merus of cheliped longer than distal end.

—A small species. Carapace one-third broadest behind, with oblique and transverse striae, the latter being most numerous in the cardiac and intestinal regions, and granulated in the middle of the carapace; intervening space granulated. Orbital margin, strongly convergent posteriorly, armed with two teeth, the inner one twice as large as the outer. Cheliped slightly more than half as wide as carapace, edge of fingers with three shallow sinuses, sides little oblique, with a transverse granulate line on each of the two fingers. The superior frontal lobes of the middle pair are very oblique, flattened.

Carapace, about two-fifths the width of the front of the head.

Measurements.—Male (9370), length of carapace 4.9 mm.

Habits.—Found among stones, roots of mangroves

Range.—From Bahamas and Florida Keys to Mexico (Cano). From California (Kingsley) to Peru. Also Bermudas; West Africa; and the Orient. Occasionally brought from further north; specimen of whaler at Provincetown, Cape Cod.

Material examined.—

Whaler, Cape Cod, Massachusetts; Sept. 3, 1878; 2 males (19023).

Preston, South Carolina (M. C. Z.).

Providence, Bahamas; 1886; *Albatross*; 1 female. Crooked Island, Bahamas; May 14, 1912; Paul Barlow, near lighthouse, south of South Bight; 1 female. Landing, south side of east end of South Big Island; 1 male (45573).

Lake Kissimmee, Florida; A. M. Reese; 1 male. Florida, Florida; Edward Palmer; 1 y. male. Sand Creek, Florida; ocean front; Dec. 17, 1906; 1 male (33147).

Pond Key, Florida; 1884; Edward Palmer; 1 sp. pair. Moor of Key West, Florida; 1884; Edward Palmer; 1 y. (9370).

620).
at Cape San Antonio; 1 male, 1 female (48621)
as; on sand, shell, grass to mud bottom; Jun.
females (48593); 1 male, 3 females (48591)

reef flat between Cayo Hutia and Little Cayo
y. (49593).

Mar. 1-11, 1884; *Albatross*; 3 females (18567).
Bay, Jamaica; rocks in front of sea view, la.
; E. A. Andrews; 4 males, 2 females (1 ovig.)
nds, Montego Bay, Jamaica; 1910; C. B. Wilson
(42888). On the mangrove roots with sponge
June 20; 1 male (42883). From sponge on ree.
.0; 1 male, 2 females (1 ovig.) (42886).

Harbor, Jamaica: T. H. Morgan; 3 males, 2
93; R. P. Bigelow; 1 male, 5 females, 2 y. (1790).
, Jamaica; P. W. Jarvis; 2 males (19062).
ango, W. I.; 1878; W. M. Gabb; 5 males, 7
;

; 1899; *Fish Hawk*: Beach, San Juan; Jan. 12
(24011). Mayaguez; Jan. 19; 2 females, 2 y. (24012).
guez; Jan. 21; 1 female (24027). On coral reef,
3; 6 y. (24017). Porto Real; Jan. 27; 2 y.
y; Jan. 28; 1 female (24028). On coral reef,
3; 1 male (24025). Guanica Bay; Jan. 28;

stone reef; June 23; 2 males (25704). Ribeira, Cabedello; on mangroves; June 20; 1 male (25705). Parahyba River; on mangroves; June 21; 1 male (25706). Pernambuco stone reef; July 7; 1 male (25707). Stone reef; 5 miles south of Pernambuco; July 6; 1 male (25708). Stone reef; June 18; 4 males (25706). Brazil; May, 1915; J. N. Rose; 1 male (48298). Ilha de Itaparica, Bahia, Brazil; 1876-1877; R. Rathbun; 4 males, 1 female (40825). Fernando de Noronha Islands, Brazil; Dec. 27, 1887; *Albatrosa*; 1 male (22095). Rio de Janeiro, Brazil; July 20, 1915; 1 male, 1 female (48301). Rio de Janeiro (?), Brazil; U. S. Expl. Exped.; 2 males (2329). São Paulo, Brazil; 1902; R. Krone, collector; 2 females (47852). Brazil; 1876-1877; G. Brown Goode; 20 specimens (39247). E. Verrill and party; 5 specimens (39247); taken from gill cavity. São Pedro e São Paulo Islands; 1876-1877; G. Brown Goode; U. S. Eclipse Exped. to Africa; 4 males (39247). Australia; near Sydney, Australia; Australian Museum; 4 specimens (43776). Pitcairn Island, South Pacific; shore; Dec. 16, 1902; 1 male (48302).

us gracilis SAUSSURE, Mém. Soc. Phys. Hist. Nat. Gen., p. 443 [27], pl. 2, fig. 15 (type-locality, St. Thomas Mus.).

dalupensis DESBONNE, in Desbonne and Schramm, Cr. p. 47, 1867 (type-locality, Guadeloupe; type prob.

s gracilis STIMPSON, Ann. Lyc. Nat. Hist. New York 113.

ptograpsus) rugulosus VON MARTENS, Arch. f. Naturg. 72, p. 108; not *Leptograpsus rugulosus* M. Edw.

One side tooth. Sides strongly convergent. Inner edge of movable finger tuberculate. Merus at posterior distal end.

—Same size and general appearance as *P. transversa*, distinguished by the following characters:

1 intestinal regions smooth. Margin behind head or nearly straight. Front nearly two-thirds of edge convex, upper surface smooth, without lobes. Inner lobes obsolescent, outer pair considerably larger. Orbit between one-third and one-fourth width. Projection of wrist a sharp spine. Upper margin of subinferior ridge stronger. Dactyli spinulous, irregularly toothed, nearly meeting when closed. Abdomen rough with tubercles. Abdomen broader. Ovaries pinkish.

Male (24014). Length 12. Width 15.9 mm.

neron Bay, Porto Rico; Jan. 27, 1899; Fish
le (24037).
nilla, Colombia; Mar. 16-22, 1884; *Albatross*;
).

Parahyba do Norte, Brazil; on mangroves;
Greeley, Branner-Agassiz Exped.; 1 male (257)
informa, Bahia, Brazil; 1876-1877; R. Rathb
ons; 2 males, 3 females ovig. (40603).
nudas; 1876-1877; G. Brown Goode; 2 specime

PACHYGRAPSUS MARMORATUS (Fabricius).

Plate 62.

Grapsus marmoratus FABRICIUS, Mant. Insect., vol. 1, 17
locality unknown; type not extant).

Grapsus marmoreus OLIVIER (after Fabricius), Encyc. M
Insectes, vol. 6, 1791, p. 161.

Grapsus femoralis OLIVIER, Encyc. Méth., Hist. Nat., Inse
p. 166 (type-locality, *sur les rivages de la mer méditerranée*,
probably not extant).

Grapsus marmoratus OLIVI, Zool. Adriat., 1792, p. 47, pl.
locality, Adriatic; type probably not extant). Her
new species.

Grapsus varius LATREILLE, Hist. Nat. Crust., vol. 6, p. 67, a
(type-locality, *sur les côtes de la Méditerranée, près de*
type in Paris Mus.).

Grapsus marmoratus DUMERIL, Dict. Sci. Nat., vol. 19, 18
Diograpus varius ? DANA, U. S. Expl. Exped., vol. 13, C
p. 244.

whole convex, edge sinuous, faintly bilobed, a
uperior lobes prominent, outer pair oblique,
air.

at the distal end of the arm and the inner
sharp. Upper margin of palm and proxima
ulate; a ridge on distal half of lower part of p
which is obsolete in old specimens.
pollex prominent near its middle; fing
gaping.

Legs with the customary spine on
terior border; first pair with one
spine; second and third pairs with
four; last pair entire.

Color.—A mixture of shades of green,
brown, and white. One variety is cov
transverse bands of white; another
lutely black. (After Risso.)

Measurements.—Male (14864), length
carapace 27.8, width of same 30.7 mm.

Littoral. Risso¹ says of these crabs that they
ir activity at the least sign of danger until ass
holest them, when they resume their sports and
akes the least movement to seize them they fle
ures in the rocks to hide in, and threaten w
leave the water many times a day to walk in

smooth above. Merus of last leg entire behind.

Opinion.—Carapace almost quadrate, slightly flattened. Sides nearly straight, two teeth behind which is large and very pointed, the other teeing.

somewhat deflexed, convex, very finely crenulate; front subequal, rather flat.

Ce transversely striate, ridges hidden by short hairs; medial area smooth.

margin of arms crest-like, three or four sharp tubercles above, an acute tooth at inner angle; fingers tuberculous, outside and below smooth; fingers

last joints of legs hirsute, first to third pair with a tooth at extremity above and below; that of fourth pair with a tooth above, but entire below.

Measurements.—Female type, length of carapace 15 mm. (After Heller.)

Type.—Chile (Heller).

PACHYGRAPSUS CORRUGATUS (von Martens).

Plate 160, fig. 4.

Leptograpsus (Leptograpsus) corrugatus von MARTENS, Arch. Mus., pt. 1, 1872, p. 107, pl. 4, figs. 8 and 8b (type-locality, Cat. No. 3702, Berlin Mus.).

uba (von Martens).

Genus PLANES Leach.

BOWDICH, Excursions in Madeira and Porto Santo, 1825, p. 12, figs. 2a and 2b; type, *P. clypeatus* Bowdich = *minutus* MILNE EDWARDS, Hist. Nat. Crust., vol. 2, 1837, p. 100 (Linnaeus).

Square-oval, about as long as broad, convex. Lines on the carapace faint. Sides converging acute; behind it a slight notch forming

at half width of carapace, gently deflexed, lobes almost obsolete.

a slight notch below near the outer angle; inner legs articulating at middle of anterior margin of chelipeds.

flattened, somewhat natatory. Teeth on merlans than in *Pachygrapsus*.

much as in that genus.

two species which are pelagic, one of them of distribution. Species on both sides of the co-

KEY TO THE SPECIES OF THE GENUS PLANES.

uniformly convex; postero-lateral margins arcuate—*minutus*
depressed about the middle; postero-lateral margin

- p. 68.
sus cinereus SAY, Journ. Acad. Nat. Sci. Philadelphia, p. 99. Not *G. cinereus* Bosc, 1802.
sus pelagicus SAY, Journ. Acad. Nat. Sci. Philadelphia, p. 442 (type-locality, Gulf Stream; type not extant).
es clypeatus BOWDICH, Excursions in Madeira and Po-
p. 15, pl. 12, figs. 2a and 2b (type-locality, between Lish-
on logs; type not extant).
sus testudinum ROUX, Crust. Médit., 1828, p. (52), pl. 0
locality, *dans le roisinage des côtes de la Sardaigne*; ty-
extant).
sus pelagicus ROUX, Crust. Médit., 1828, p. (55), pl. 0
sus (Grapsus) pusillus DE HAAN, Fauna Japon., Crust.,
pl. 16, fig. 2 (type-locality, Japan; type no longer in Le-
ilograpsus minutus MILNE EDWARDS, Hist. Nat. Crust.,
p. 90.
sus diris COSTA, Fauna Napoli, Crust., 1838, pl. 4, fi-
sponding text) (type-locality, Gaeta; type probably no
ilograpsus major McLEAY, in Andrew Smith's Zool.
Annul., 1838, p. 66 (type-locality, South Africa; ty-
extant).
ilograpsus smithii McLEAY, in Andrew Smith's Zool.
Annul., 1838, p. 67 (type-locality, South Africa; ty-
extant).
es minutus WHITE, List Crust. Brit. Mus., 1847, p. 42.
es linnacana BELL, Brit. Stalk-eyed Crust., 1851, p. 13
(Devon and Cornwall; type in Brit Mus.).
es cyaneus DANA, Proc. Acad. Nat. Sci. Philadelphia,
(1852), p. 250 (type-locality, *in mari Pacifico, lat. bor.*
74°; type not extant).

inner angle of wrist subacute. Palms with groove and below, a longitudinal line on the pollex and brokenly on the palm. Pollex with a prominence of its prehensile edge. Fingers narrowly oval.

Third legs subequal, one and one-half times as long as the leg shortest. Merus joints with an inconspicuous terminal tooth, and a few posterior denticles, increasing in length from the first to the fourth pair, where the three segments thorny and with a dense fringe along the anterior edge.

male regularly triangular from the middle to the end.

Extremely variable. Usually irregularly mottled, light greenish-yellow or pale yellow on a darker color, the carapace thus imitating the olive-green gulfweed (*Sargassum*) and the whitish patches (*Gracilaria*) with which the *Sargassum* is commonly associated.

In size and color see page 671 and Plate VI of Muraenidae of the Ocean," 1912.

Types.—Male (17712), length 18.9, width 18.7 mm.

Distribution.—Pelagic, common in gulfweed, especially in the Sargasso Sea; occasionally on turtles, floating logs and debris, and in living sponges. In all tropical and temperate waters.

cross the anterior half transversely and in
al region obliquely. Surface of front cover
nd minute granulation; free edge arcuate and f
be appearing in front view slightly bilobed;
granulated rim; post-frontal lobes low. Anter
nvex, with one blunt tooth behind the tooth a
it; postero-lateral margins nearly straight, co
peds equal, massive; upper and lower margins
striated, inner expansion irregularly denticula
wrist finely striated, tooth at inner angle blu
early smooth, shining, punctate, upper surface
th finely granulated longitudinal lines which l
ally. Fingers stout, prehensile edges narrowly
larger tooth at middle of fixed finger.

short and broad; third foot one and one-half ti
e; merus of third pair three-fifths as broad as
nd stumpy, armed with coarse spines.

species of *Planes* have been described in th
are referable to variations of *P. minutus*; l
to be distinct. It has a great resemblance to
d forms a link between the two genera.

In *Planes minutus* it differs in its broader carap
ed about the middle instead of uniformly ex
lateral margins being nearly straight, as in
uate as in *Planes minutus*; in the more extensi
sal surface; in the broader basal joint of the

anted near the middle of the distal margin of the
ous. Abdomen of the male seven-jointed. (H
from the type-species.

GRAPSODIUS EXIMIUS Holmes.

eximius HOLMES, Occas. Papers California Acad. Sci.
34, (type-locality, San Diego; type in Mus. Univ. Cal.).

Sides converging behind, unidentate. Posterior
bulging outward. Maxillipeds slender.

—Carapace undulated in front, flattened behind,
strongly striated; sides strongly converging post
half width of carapace, outer angles more or less
elevated; anterior edge thin and minutely granulated,
is nearly straight, being slightly convex on either
where it is a little concave; viewed from in
d in the center.

are remarkable in being swollen outward so that
the eye is placed in front of the mouth, instead of in
the eye, as is usually the case, for the reception of
margin marked by a fine ridge; inferior margin
is from the postorbital tooth to the buccal area
slender and wide apart. Ischium much longer
so wide; merus with outer margin convex and
broadly rounded, inner margin straight and
produced in a prominent narrow lobe. First
gently convex near the middle of the inner margin.

strongly convex; fifth segment scarcely longer than the sixth; last segment triangular, acute.

Measurements.—Male holotype, length of carapace 11.2 mm., width of front 11.2 mm.

Ecology.—Known only from Doctor Holmes's description of a male from San Diego, California. (After Holte)

Subfamily VARUNINAE Alcock.

Varuninae DANA, Amer. Journ. Sci., ser. 2, vol. 12, 1851
U. S. Expl. Exped., vol. 13, Crust., pt. 1, 1852, p. 334 (part).
Varunacea MILNE EDWARDS, Ann. Sci. Nat., ser. 3, Zool.,
vol. 175 [141].

Euchirograpsacea MILNE EDWARDS, Ann. Sci. Nat., ser. 3, Zool.,
vol. 175 [141].

Varunacea MILNE EDWARDS, Ann. Sci. Nat., ser. 3, Zool., vol.
175 [141], (part: *Euchirograpsus*).

Anterior margin moderately or little deflexed, sometimes subparallel. Posterior margin of the postero-lateral portion of the branchial region separated from the rest of that region by a line more or less distinct. A low orbital crest, which supplements the defective anterior margin of the orbit, is rather distant from the orbit and usually situated near the anterior border of the epistome. Anterior margin of good length. External maxillipeds moderately long, without an oblique hairy crest; the palp articulated near the middle of the anterior border, or near the antero-exterior corner of the exognathus, and the exognathus while typically broad

joint of the antenna, half fills the inner hiatus; second movable joint occupies the remainder of the flagellum to enter the orbit.

Cavities broadly triangular, the antennules slender, antenniferous septum narrow. Orbit transverse, and shallow fore and aft. Buccal parallel, anterior margin arched beyond the outer margin. Mandibles have a moderate gape; merus and ischium about as wide as long, subequal, wider than ischium and as wide as long, subequal, palp articulating at the middle of the anterior margin; chela equal, in the male heavy, from one and two-thirds to two and one-half times as long as the carapace. Palms very narrow, hollowed underneath.

Carapace narrow, the second and third pairs much the largest.

Abdomen with seven segments in both sexes; and in the female the fifth segment exposed at its base. First segment with a large granulated ridge visible in a dorsal view.

Two species inhabiting South America. Species of the continent: *angulatus*.

KEY TO THE SPECIES OF THE GENUS CYPTOGRAPSIUS.

Teeth prominent, projecting beyond the general edge of the carapace-----*angulatus*
Teeth not prominent, not projecting beyond the general edge of the carapace-----*altissimus*

single curved line of granules runs inward from lateral margin is a low, blunt, obtuse-angled spine; pedipalps granulate. Inner surface of carpus flattened.

Propodus of adult male a little higher than flattened above; a longitudinal ridge above Dactylus one and one-fourth times as long as upper phalanges; pollex slightly deflexed. Fingers with a narrow web and low.

Second pair of legs the longest. Merus joints of all legs parallel sides, and a subterminal tooth on the anterior three joints of last pair fringed with hair; propodus of first and second pairs fringed posteriorly.

Measurements.—Male holotype, length of carapace 4.5 mm.

Type.—From Rio de Janeiro, Brazil, southward to northward on the Pacific coast to Peru.
Material examined.—

1 ♂, Rio de Janeiro, Brazil; Capt. Harrington; 1 male (6125, M. C. Z.); received from Peabody A.

Montevideo, Uruguay; 1897; Bisege, collector; 1 female (48318).

1 ♂, Rio de la Plata; Capt. Page, collector; 2 males identified (2469).

1 ♂, Negro, Patagonia; U. S. Exploring Exped.; 2 males (2469).

man in *angulatus*, and the postero-lateral margins subparallel to each other. The antero-lateral teeth, including the orbital tooth, but they are the last two, and do not project beyond the margin between the teeth diminish successively in indication of a postero-lateral tooth.

This is relatively wider than in *angulatus* and is feeble in the middle; the orbits are correspondingly smaller. The maxillipeds have much the same shape in the *angulatus* and *altimanus* they are shorter and wider and the

in the adult male are much higher in our specimen than in *angulatus*. The distal end, and the movable finger is strongly curved; the finger is nearly horizontal; there is a triangular depression between the fingers for their proximal half only.

The claws are broader than in *angulatus*, second and third pairs slightly longer than the first; joint and proximal part of terminal joint of first pair fringed with hair on the posterior margin; last two joints of carpal joint of last pair fringed with hair on the outer side.

The carapace of the male is narrower and more oblong than in *angulatus*, and the appendages of the first segment slenderer. Measurements.—Male holotype, length of carapace 16.8, width 11.5, height 6.5.

Collected near Rio Grande do Sul, Brazil, and San Matias Bay, Argentina.

nnules folding obliquely. Tooth at inner angle well developed. Antenna filling the orbital hiatus; flagellum long. The suborbital crest forms a tuberculated or serrated ridge which scrapes against the distal end of the maxilla well developed.

Maxillary cavity quadrate with the anterior corners rounded. Legs moderately long; tibiae longer than femora; tarsi longer than tibiae; ischium, and as broad as, or broader than the femur; outer margins convex, anterior margin excavate, with a deep pit toward its outer angle.

Fingers equal or subequal, stout. Palms often wider than fingers. Fingers hollowed out beneath in a shallow pit of moderate length, and almost unarmed.

Abdomen of the male does not cover the sternum.

Distribution.—Temperate shores of the Pacific Ocean; South Atlantic coast of America.

KEY TO THE AMERICAN SPECIES OF THE GENUS HEMIGRACER

With lateral teeth behind the orbital angle-----

Without lateral teeth behind the orbital angle.

Epistome with stero-lateral margins strongly convergent. Legs with hair-----

Epistome with stero-lateral margins not sensibly convergent.

Legs devoid of hair. Two deep sinuses in the epistome.

Legs more or less hairy. Two shallow sinuses in the epistome.

st tooth. Above the bases of the last two legs
ns parallel to the margin.

inctly less than half width of carapace, edge
r angle obtuse.

very large. The basal and succeeding joint
ther fill the orbital hiatus. The posterior margin
egularly arcuate as seen from below. Merus
uch wider than ischium, its outer margin very
asserted not far from the middle.

lating ridge is crenulate, the crenules becoming
ter end; it scrapes against a short portion of the
inner margin of the arm. Arms short, stout,
bove near the distal end. Wrist with inner
chelae heavy, palms strongly widened distally, w
th, upper surface partly flat. Fingers rather
acute, a triangular gap at base in the male, na
ers subacute; several longitudinal rows of punc
the outer side of the pollex a fairly distinct ridge
ridge is more pronounced and is continued a

er, especially the dactyli; last pair much the
ept for a feeble tooth near the end of the meru
h a few hairs; dactyli grooved, with long slender

ent of male abdomen shorter than fifth, seventh

Trichodactylus granulatus MILNE

Sci. Nat., ser. 3, Zool., vol.

[182]. Probably a *lapsus*
granarius.

Lobograpsus crenulatus A. MILNE

Soc. Entom., ser. 4, vol. 9, 186

?*Heterograpsus barbimanus* CANO

Napoli, ser. 1, vol. 3, 1889,

Chiloe; not *H. barbimanus* H.

Heterograpsus sanguineus LENZ

(wards), Zool. Jahrb., Suppl., v.

Diagnosis.—Two side teeth.

ing behind. Chela of male hairy
with thick fringes of hair.

Description.—Of medium size;
sibly broader than long; antero-l
more strongly curved than in
postero-lateral margins strongly
flat behind, sloping down on fr
cardiac and posterior gastric re
fined; surface covered with co
granules, except posteriorly where
placed by punctae connected by
lines. Two notches in the lateral
anterior the larger) form two acu
are not prominent; interval equ
traverses the first and the orbital a

2768
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" 30 36 36 36 66

" 58 42 43 47 63

" 6 36 36 36 40

m inflated, very convex below, upper surface rounded; median ridge runs obliquely on to the pollex. Fing., teeth irregular, tips horny.

Medium width; dactylus of last pair proportionately longer than the others.

Segment of male abdomen longer than fifth, but

parts.—Male (25032), length of carapace 27.5,

Chile; west coast of Patagonia; also New Zealand. Specimens examined.—

Female; Albatross; 1 y. (22103).

Female; Chile; Plate, coll.; received from Lubeck Mus.;

Female; Chile (M. C. Z.).

Female; Patagonia; Feb. 9, 1888; *Albatross*; 47 mm. long.

Female; Otago Univ. Mus.; 1 male, 1 female (16230); Islands, New Zealand; U. S. Exploring Exped.; 1847.

Female; New Zealand; Charles Chilton; 2 males, 3 females.

Female; New Zealand; George M. Thomson; 1 male,

Unknown; U. S. Exploring Exped.; 2 males, 2 females.

cription.—Carapace flat and punctate behind, smooth in front. A curved line of light-colored punctations from the last side tooth to the end of the H impinging on the anterior margin of the epipharyngeal shield bilobed with a shallow emargination, edge thickened, lobes not very prominent. Antero-lateral margin of the epipharyngeal shield with two teeth behind the orbital tooth, intermediate teeth very small.

Anterior margin of epistome with two broad, deep, irregular depressions. Outer margin of merus of maxillipedous smooth.

Stridulating ridge composed of about 15 tubercles, largest in the female; in the male they are largest at the outer end; in the female they are large enough to give scrapes against a smooth horny ridge on the lower distal angle of the inner surface of the arm of the maxilliped smooth. Inner angle of wrist bluntly angular, with a longitudinal ridge on the lower part of the angle, this is stronger in the female than in the male. Finger-like, furnished with a patch of long fine hair at the distal surface, and extending on the pollex. Fingers narrow, tips narrowly gaping in the male, tips horny.

Claws stout, rather short, smooth, and nude. Legs, those of the last pair especially short, their tips black.—Variable, generally of a mahogany red, but dark red, or red marbled with white, occasionally black. Claws blackish brown.

Revillagigedo Island, Alaska; May 30, 1904; B
females (1 ovig.) (44537).

Revillagigedo Island, Alaska; Dr. T. H. Streeter;
13 females ovig. (14805).

Bayne Sound, British Columbia; May 14, 1900;
s, 3 females (2 ovig.) (44500).

and, British Columbia; *Albatross*: Shore; Ju
). North end, on shore, between tide marks;
s, 19 females (9 ovig.), 7 y. (49911). North si
les, 2 females (1 ovig.), 3 y. (49915).

land, Taylor Bay, British Columbia; June 2
males, 6 females (31590).

British Columbia; July 10, 1888; *Albatross*; 2
28). Beach; Aug. 2, 1897; Harlan I. Smith; 4
ore; June 19, 1903; *Albatross*; 6 males, 3

British Columbia; Mr. Nichols; 3 males (1 paper)

nd, 7 miles from Victoria, British Columbia;
nedict; 1 male, 1 female (31505).

e, British Columbia; Sept. 15, 1895; F. W.
e (19196).

uca; 1880; D. S. Jordan; 4 males and females
Washington; Apr. 27, 1914; *Albatross*; 11 m
ovig.) (49912).

nens (23922). June, 1905; J. E. Benedict;
Barbara, California; 1880; D. S. Jordan; 1

ina Harbor and Island, California; 1874; W
female (14802).

Point, San Mateo County, California; June 3
1 male, 1 female (29311).

Loma, San Diego Bay, California; *Albatross*

Bay, Lower California; Aug. 1, 1896; A. W
0 females (19512).

HEMIGRAPSUS OREGONENSIS (Dana).

Plate 70.

Hemigrapsus oregonensis DANA, Proc. Acad. Nat. Sci. Phila., 1851 (1852), p. 248 (type-locality, *in Oregoniae freta*); male, Cat. No. 2333, U.S.N.M.) ; U. S. Expl. Exped., vol. 852, p. 334; atlas, 1855, pl. 20, fig. 6a-b.

Cynnotus oregonensis HOLMES, Occas. Papers Calif. Acad., vol. 7, 1900, p. 82.

Hemigrapsus oregonensis RATHBUN, Amer. Nat., vol. 34, 1900.—Broad in front. Two side teeth. Surface with two prominent lobes. Palm of male with two rows of tubercles. Legs hairy.

Description.—Differs from *H. nudus* as follows:

ts.—Male (2320), length of carapace 28.4, w

om Prince William Sound, Alaska, to Gulf of

mined.—

Alaska; Harriman Alaska Exped.; 1 male (238

a: L. A. Beardslee; 1 male (14807). W. H. I

les, 1 y. (14810). *Albatross*; 1 male (19347).

aska; beach, low tide; July, 1882; Dr. W. H.

. S. S. *Wachusett*; 2 males (5330).

Alaska; Feb. 22, 1882; Dr. W. H. Jones, U. S.

Wachusett; 17 males and females (5317).

Prince of Wales Island, Alaska; June 17, 1897
(21790).

Sandra, head of Mink Arm, Alaska; July 6, 1903
s (31594).

Beaver Bay, British Columbia: June 25, 1903
e (31672). Between high and low tide lines,
etc.; Harlan I. Smith; 2 males, 1 female (22590).
British Columbia; 1893; *Albatross*; 80 specimens (

Bayne Sound, British Columbia; May 14, 1906
, 61 females (44499).

nd, British Columbia; 1914; *Albatross*: Nor
en tide marks; Apr. 18; 18 males, 8 females (2

owstone Point, near Port Townsend, Washington; albatross; 1 male, 7 y. (31592).

Ludlow, Washington; S. Bailey; 6 males and females.

Orchard, Washington; July, 1889; O. B. Johnson; (14968).

Port Bay, Washington; Dec., 1914; W. L. McAtee; 1 female.

Cent City Bay, California, lat. $41^{\circ} 42'$ N.; 6 fms; 5326).

Males Bay, Marin County, California; April 28, 1888; 1 male, 1 female (49103).

Alcatraz Island, San Francisco Bay, California; November 1888; 26 specimens (20163).

Point Mugu, California; H. Hemphill; 7 males (2288).

Point Mateo, San Francisco Bay, California; 3 females; 10+ specimens (20165).

San Francisco Bay, near Palo Alto, California; July 1888; 2 males (29315).

San Francisco Bay, California; in sandy locations under low tide marks; Harold Heath; 1 male, 4 females.

Santa Barbara, California; June, 1875; Dr. H. C. Allen; 1 male.

Off coast west of 100th meridian; 25+ males and females.

Long Beach, California; June, 1888; Dr. J. A. Allen; 1 male.

San Pedro del Rey, Los Angeles County, California; May, 1888; 3 males (48818).

Catalina Island, California; 50 fathoms; H. N. Bryant; 1 male.

refugio, Angel Island, Gulf of California; Mar. 27, 1896; male (17453).

Gonzales Bay, Gulf of California; Mar. 27, 1896; 18 specimens (17452).

Bay, Sonora, Mexico; shore; Feb. 20, 1904; Wm. J. Abbott (1511).

abor, Guaymas, Mexico; Feb. 23, 1891; P. L. J. Abbott (17292, 17293).

unknown; 1 y. (17685); and 1 male, U. S. N. M. (17684).

TETRAGRAPSUS, new genus.

jouyi (Rathbun).

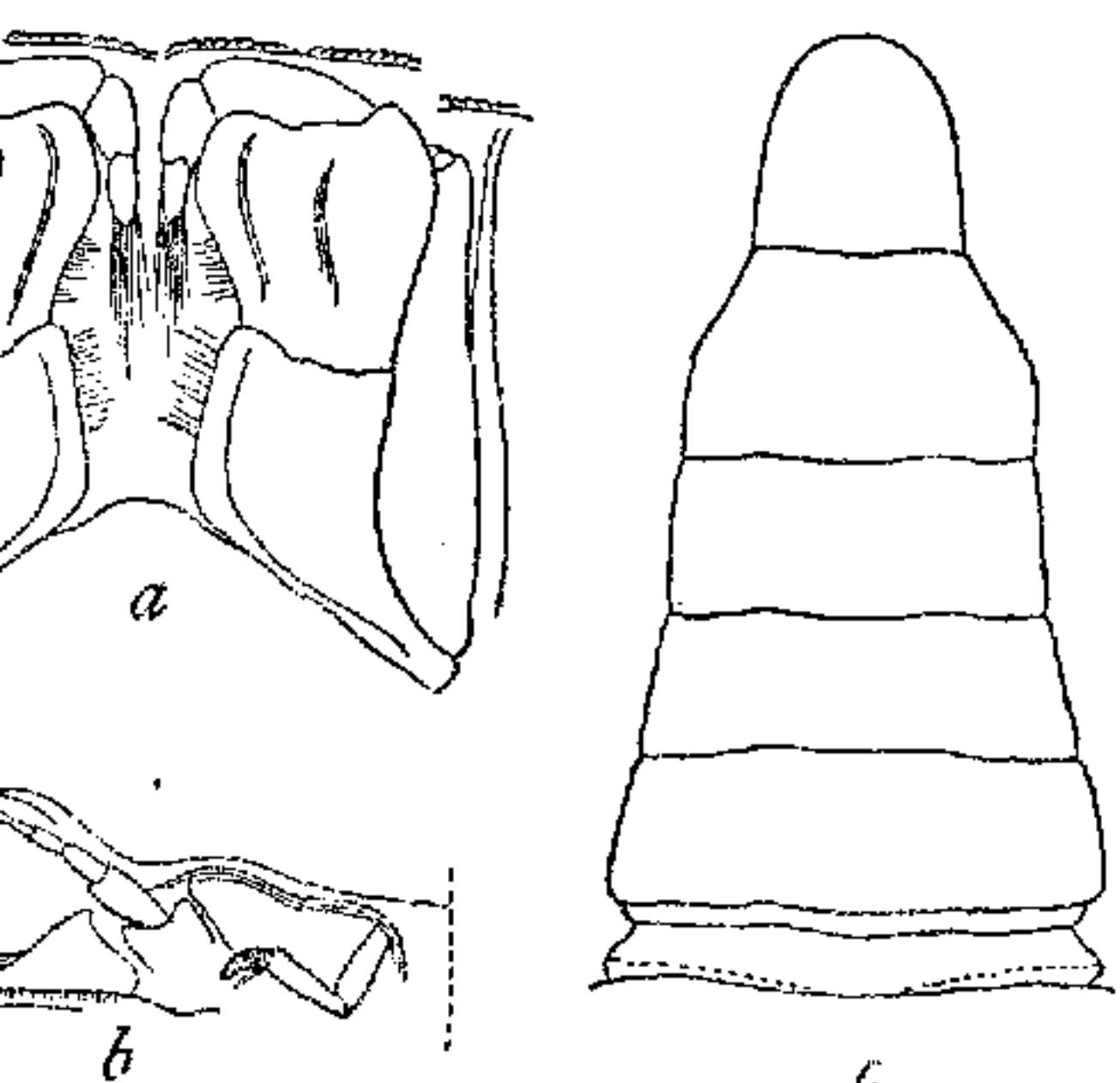
quadrate, with the side margins parallel, dentate, one-half width of carapace, curved gradually downward beyond the antennules or epistome. Orbit complete; eye slightly elongate. Suborbital ridge present.

Maxillipeds gaping, merus longitudinally compressed, wide, and as long as, but wider than, the ischium. Maxillipeds resemble those of *Hemigrapsus* in form, but not approximate. In the shape of carapace, and in the character of the suborbital ridge this resembles *achynotus* de Haan,¹ but in the latter the front maxillipeds smooth, their merus short and broad.

inish in size from the first to the last, the last
ar, their outer margin convex; the last is s
margin

Epi
narrow
front
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Inne
postori
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male
striate
formed
elongat
cles, t
which
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TETRAGRAPSUS JOUYI, MALE (17496). *a*, BUCCAL
 $\times 8\frac{1}{2}$; *b*, ORBITAL AND ANTENNAL REGION, $\times 6\frac{1}{2}$;
EX, $\times 6\frac{1}{2}$.

striated portion; in the female there are fo
n tubercles and at the inner end a few denticles
surface of arm crossed by short squamiform
a very prominent lobe on the distal half
ears a horny ridge. Inner angle of wrist produ
th in the male, a spine in the female. Pa
smooth, above proximally marginate; fingers ste

us BENEDICT, Johns Hopkins Univ. Circ., vol. 11, No.

type, *A. jamaicensis* Benedict.

thick, much broader than long and broader behind; dorsal surface distinctly areolated. Lateral ocellate, quadridentate anteriorly. Front arched and antennulae, but excavated and deflexed in the middle and nearly perpendicular, crossed transversely. Labial border straight as seen in a front view, distinct notch in the middle, as seen from below, in the epistome, in the antero-lateral angle of the buccal capsule and narrow notch, which serves as an effector for the longitudinal ridges.

Antenna movable, filling the whole space between the regular, inner, suborbital lobe and the front; remaining in the orbit.

Xillipeds with their inner margins almost equal, merus of nearly equal length; both very broader than long, its antero-lateral angle not expanded near that angle.

Claws longer than dactyli; dactyli quadrangular, their angles acute.

Length of male with seven distinct segments.

Two species only, inhabiting opposite sides of the Atlantic Ocean, *jamaicensis* (Atlantic); *impressus* (Pacific).

East.

lobe separated as a small but very distinct lobe opposite the fissure of the orbit. Epibranchial slightly separated from the mesobranchial by well-defined impressions. Posterior portion of branchial region divided into a flat inner area, and a broad area between the ridge and the lateral margin.

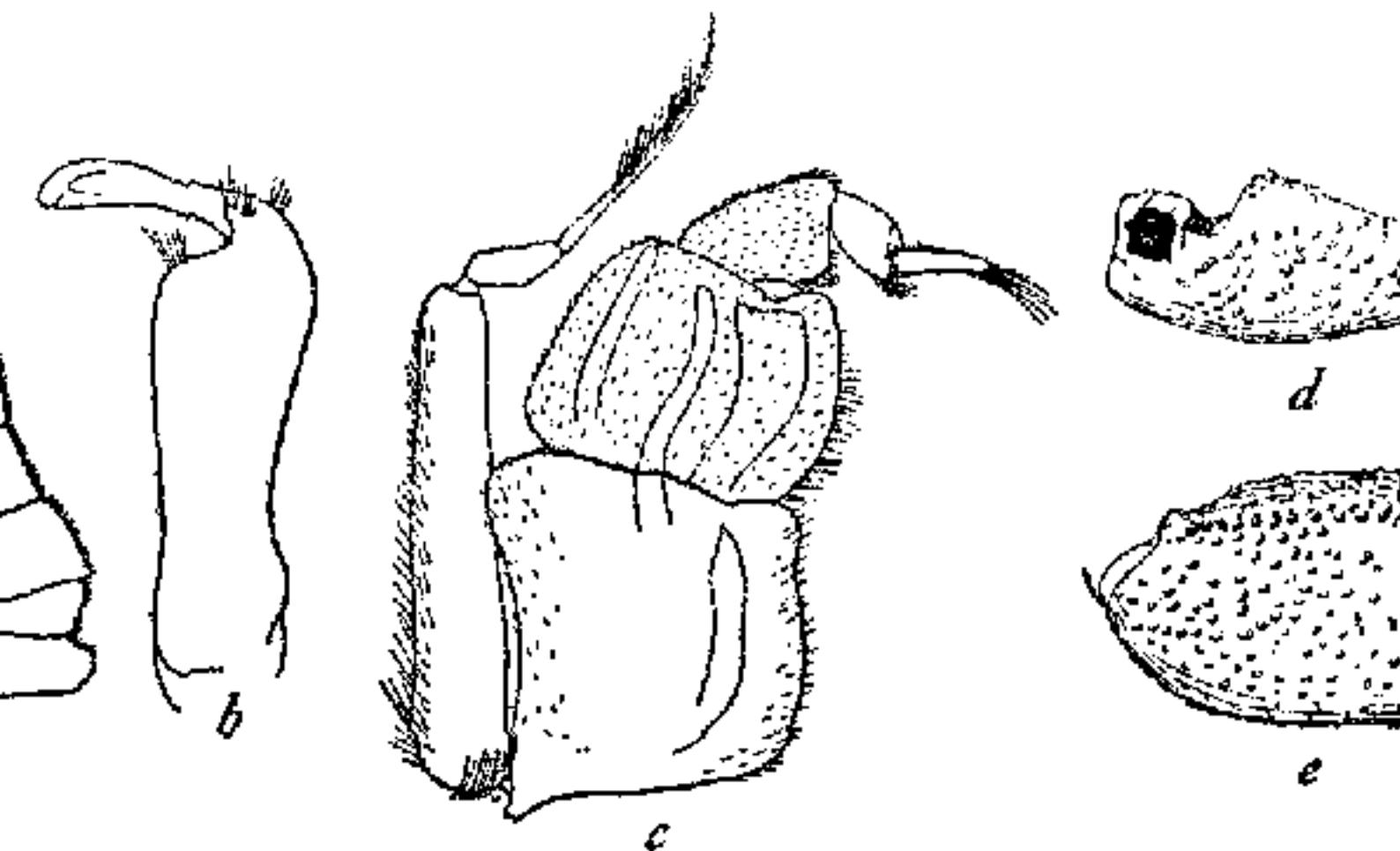
as seen from before, very sinuous, and broken into, deep, rounded sinus; its outer angles, as seen from above, rounded, the margin continuous to the inner angle where it passes abruptly downward beneath the occipital ridge, leaving a distinct notch, above which the margin is continuous to the acutely triangular tooth which is prominent and directed straight forward; first tooth of the lateral margin, broad, obtuse, in the plane of the orbital tooth; second and third acute; last tooth on the postero-lateral margin somewhat below the level of the preceding ones. Infero-lateral region straight, finely dentate. Infero-lateral region hairy.

Legs short, very unequal. Merus short, not reaching the middle of carapace, triquetral, angles denticulate. Carpus granulous, inner edge slightly margined. Chela propodus is short and very stout, outer surface granulous; pollex very short, its prehensile edge directed downward. Dactylus straight, rather slender.

s jamaicensis BENEDICT, Johns Hopkins Univ. Circ., 1892, p. 77 (type-locality, Kingston Harbor; type, U.S.N.M.).

sus jamaicensis RATHBUN, Ann. Inst. Jamaica, vol. 1, 1907.

—Large. Fronto-orbital width less than two-thirds. Second and third side teeth short, not slender.



CRYPTOGRAPsus JAMAICENSIS, MALE. *a*, ABDOMEN, HOLOTYPE, RIGHT ABDOMINAL APPENDAGE (42881), INNER SIDE, $\times 2\frac{1}{2}$; *c*, LEFT ABDOMINAL APPENDAGE OF HOLOTYPE, $\times 3\frac{1}{2}$; *d*, TOP VIEW OF RIGHT CHELA OF HOLOTYPE, SLIGHTLY ENLARGED; *e*, OUTER VIEW OF SAME, SLIGHTLY ENLARGED.

—Closely allied to *G. impressus*. Larger and more robust. In the gastric region, as well as the lateral regions, the longitudinal ridge which separates the flat portion of the branchial region is not well marked. The lobes of the front is bilobed. There is a break

width 23, approximate length of legs, first 48, second 50.5 mm.

—Known only from Jamaica.

Material examined.—

ego Bay River, Jamaica: 2 feet, stony bottom; Wilson; 1 male (42881). Fresh water; Aug. 25; 1 female (41524).

ton Harbor, Jamaica; T. H. Morgan; 1 m-

Genus PLATYCHIROGRAPSUS de Man.

Glyptograpsus KRØVER, MS., Copenhagen Museum; type, *A. chirograpsus* DE MAN, Zool. Anz., No. 506, 1896, p. 292
subtilis de Man.

Near *Glyptograpsus*. Differs as follows: The last segment in front view, but the two halves are arcuate; the maxillipedes have between them a narrow rhombus further from the epistome.

The propodus of the large cheliped is prolonged posteriorly beyond its articulation with the carpus, and its outer surface is granular.

Tropical (in part, at least), inhabiting the Atlantic and also West Africa.

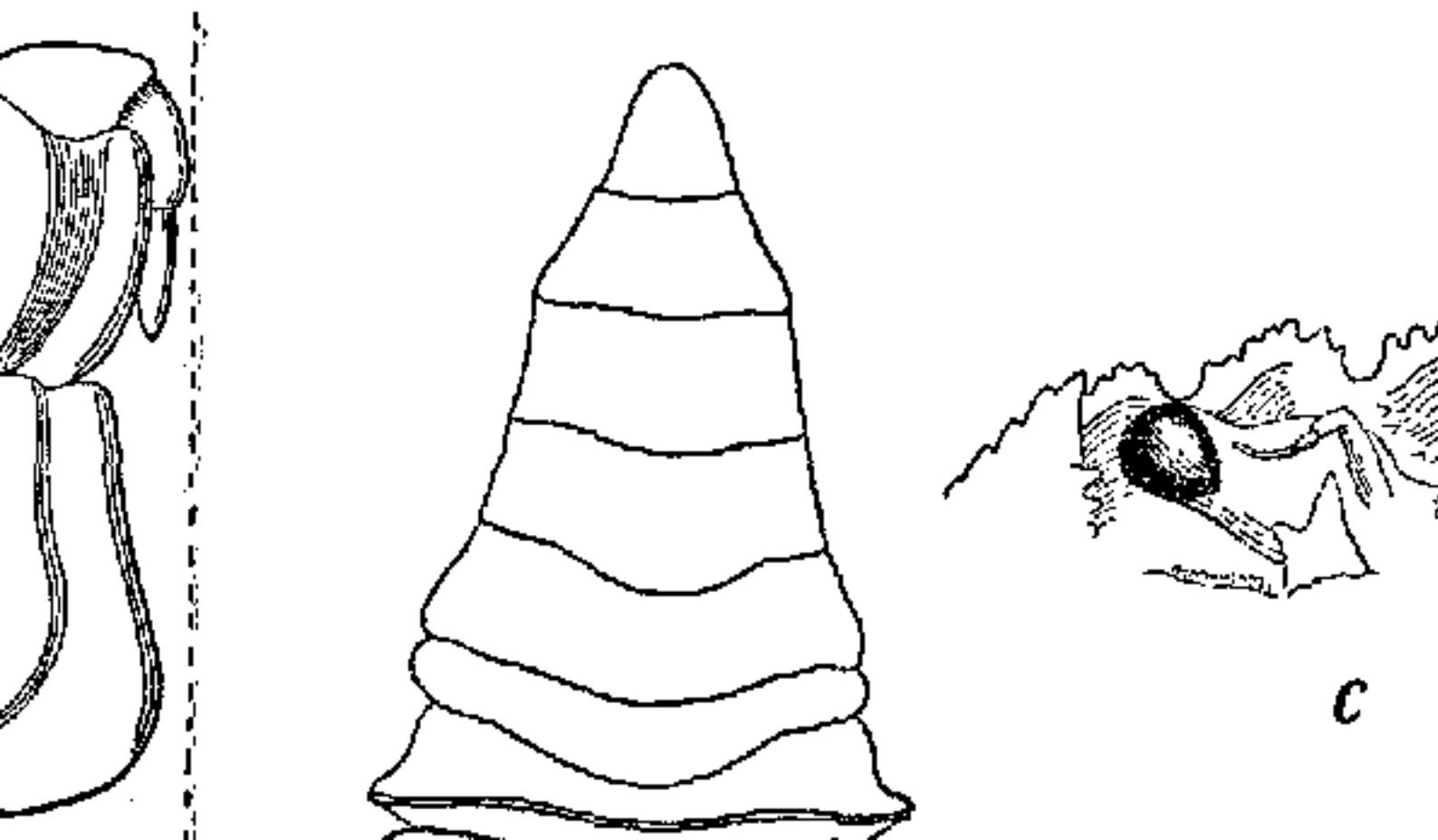
PLATYCHIROGRAPSUS TYPICUS Rathbun.

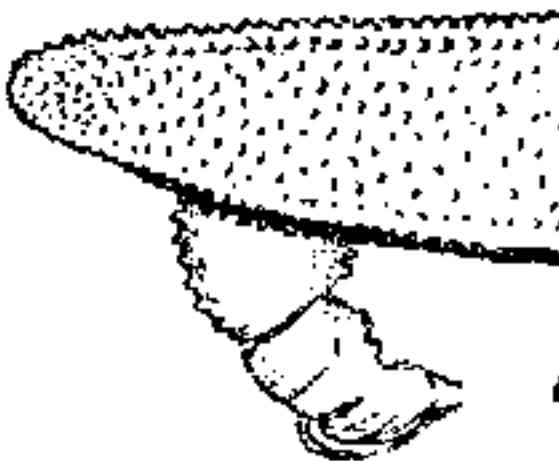
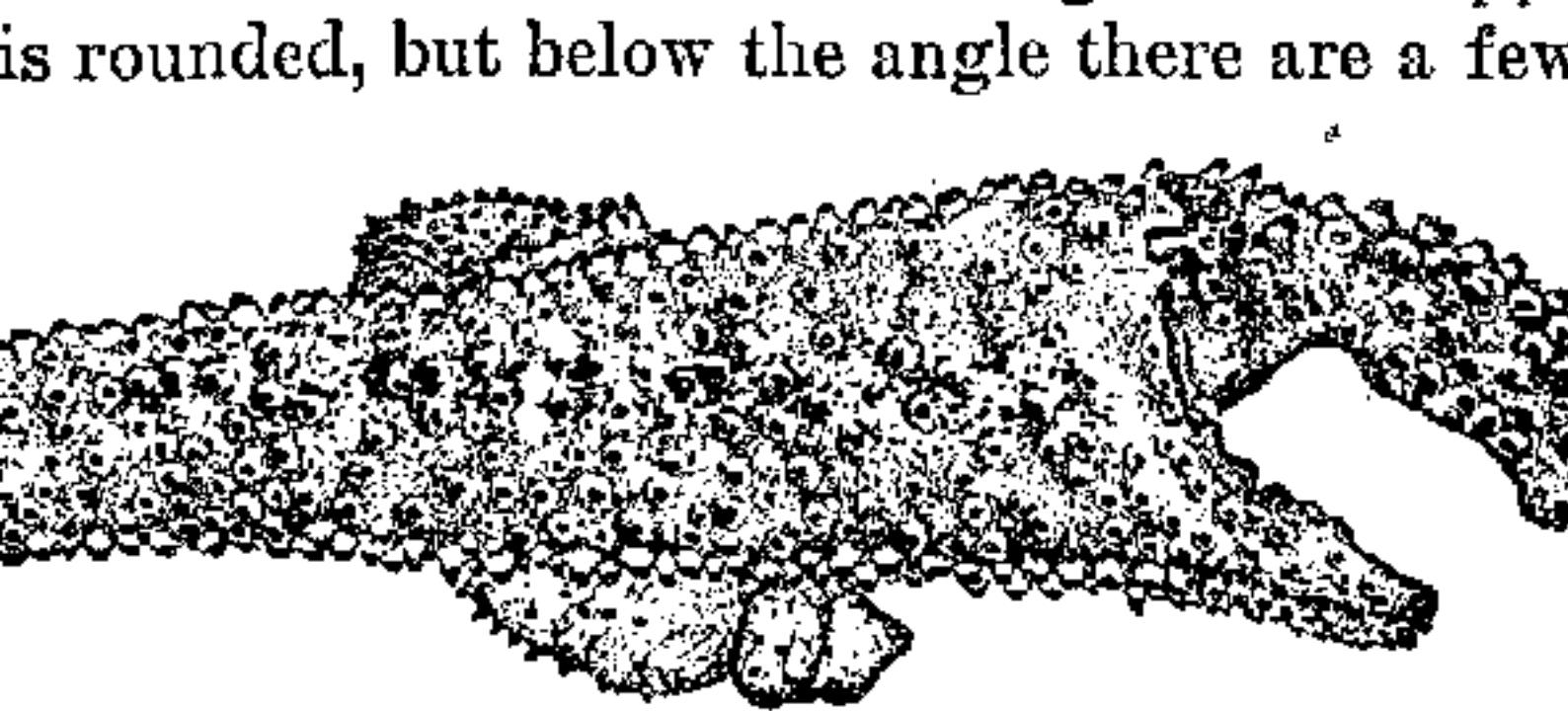
RIVER CRAB.



ECHIURGRAPSUS TYPICUS, MALE (19803), DORSAL VIEW, SLIGH

high, granulate; between them a deep furrow in the front. A very small protogastric lobule is situated in the fissure of the orbit. Outer portion of branchiostyle inclined.





LATYCHIROGRAPSUS TYPICUS, RIGHT OR MAJOR CHELIPEL. *a*,
IN HALIFAX MUSEUM, NATURAL SIZE; *b*, UPPER VIEW OF
ANTERIOR VIEW OF 19863, $\times 14$.

surface. The propodus of the large chela is , being expanded proximally in a projection length the distance from the superior articulation the dactylus; outer face quite flat, three times increasing distally, covered with tubercles; upper

ldman).

Mexico.

examined.—

na River, Montecristo, Tabasco, Mexico; 140 miles from coast, altitude over 100 feet; May 7, 1900; Nelson and Stebbins, U. S. Dept. Agri.; 2 males (1 is holotype) Mexican Exhibit at World's Columbian Exposition, Chicago (19863).

"Mexico"; 1 male (Copenhagen Mus.).
Unknown; 1 large claw (Halifax Mus.).

Genus EUCHIROGRAPSUS Milne Edwards.

Euchirograpsus MILNE EDWARDS, Ann. Sci. Nat., ser. 3, Zool., v. 15 [141]; type, *E. liguricus* Milne Edwards.

Hairy. Carapace nearly square, slightly convex. Antero-lateral angle acute; lateral margins more than half width of carapace, advanced, the orbit with an outer notch; the customary tooth is minute. The basal joint of the antenna closer to the anterolateral angle than to the orbit, the antenna entering the orbit. Antennules near the mouth well defined, very short fore and aft, broad. Buccal cavity broader than long, wider than the maxillipeds little separated. Ischium longer than broad, widening anteriorly. Merus with outer angle rounded and prominent, inner side

carapace broader than long, and
posteriorly, sloping gently down toward the sides,
covered with granules and short soft hair.
Advanced, lamellar, with a narrow median notch
and sloping backward to the small tooth at the
inner angle of the orbit. Orbit large; upper
margin oblique, sinuous, outer angle spiniform;
three smaller, subequal spines on
margin, the last much reduced.
filling the orbit; lower margin of
oblique, denticulate. Third joint
hollowed out on the inner side.
Cheliped one and one-half times
the carapace. Surface of arm, as well as
joint of the legs, crossed by fine
lines; margins spinulous, a superior
spine, four or five large spines on
half of the inner margin. Inner di-
spinulous. Palm with three spinulous ridges above
the upper edge, and another, less distinct, through
the other slender, grooved, pointed, teeth low, irregular.
Palpatus a little longer than upper margin of pa-
nel, compressed, second pair over twice as long
as the crus joints armed with a subdistal spine above and
below, one inner, the other outer; inner spine about
one-half as long as the distal spine, the latter
pair spinulous below, and armed with one or



EUCHIRO-
MERICANUS,
MAXILLIPED,
(AFTER A.
WARDS AND

	<i>Albatross</i> <i>Fish Hu</i>	<i>Albatross</i> <i>Fish Hu</i>	<i>Albatross</i> <i>Fish Hu</i>	<i>Albatross</i> <i>Fish Hu</i>
32 55 60	77 54 00	79 crs. S. bk. Sp.	59.1	5. 1885
21 m. 3SE Fowey Rocks	45 rky	70	---	Mar. 25, 1883
Lt.				
23 10 48	82 19 15	121 fine, gy. Co.	17. 1885	2330
23 10 30	82 20 25	122 Co.	30. 1884	2162
20 59 30	86 23 45	130 Co.	22. 1885	2354
20 30 15	76 20 30	42 gn. M. S.	23. 1884	2142
		27.8		

toward the angle of the bu.
Side walls of carapace finely
with granules and hairs or
External maxillipeds separate
rhomboidal gape; an oblique
traverses them from a point in
tero-external angle of the is.
point near the antero-internal
merus; the palp articulates ex.
summit, or near the antero-ext.
of the merus, and the exognath
and either partly or almost en.
cealed. The male abdomen ei.
does not quite fill all the space
last pair of legs.

Fritz Müller¹ explains the reticulation of the side with hairy ridges on the maxillipeds of crabs, which spend much of their time in the water:

The small wart-like elevations
niculated hairs form a fine net
extended over the lower sur-
carapace. Thus when a wave
escapes from the branch
(through the orifices at the ant-
of the buccal frame) it imm-

Genus SESARMA Say.

MARSH CRABS (F. Müller).

SAY, Journ. Philadelphia Acad. Nat. Sci., vol. 1, 1817,
ticulatum (Say).

de HAAN, Fauna Japon., Crust., 1833, p. 5; 1835,
lens de Haan. Not *Pachysoma* MacLeay, 1821, a genu-

tes GISTEL, Natur. Thierreichs, 1848, p. X; type, *C.*
).

pus MILNE EDWARDS, Ann. Sci. Nat., ser. 3, Zool., v.
7 [153]; type, *H. haematocheir* de Haan.

bus MILNE EDWARDS, Arch. Mus. Hist. Nat. Paris, v.
3. A slip of the pen for *Holometopus*.

DE MAN (subgenus), Zool. Jahrb., Syst., vol. 9, 1895,
hematocheir de Haan.

na DE MAN (subgenus), Zool. Jahrb., Syst., vol. 9, 1895,
ragonum (Fabricius).

ma DE MAN (subgenus), Zool. Jahrb., Syst., vol. 9, 1
S. quadrata (Fabricius) == *Cancer quadratus* Fabricius
= *S. plicatus* Latreille, 1802-1803.

ma DE MAN (subgenus), Zool. Jahrb., Syst., vol. 9, 1
S. bidens (de Haan).

squarish; sides usually straight and sometimes
times convex; surface flattened; gastric region w
d into five subregions, of which the four ant
form four prominent postfrontal tubercles.

ls massive in the male, subequal; palm high acute and hollowed at tip.

ffering little in length, third pair longest; meropon in both sexes with seven separate segments, the whole breadth of the sternum between the legs. In the female the last segment is small and in the broad sixth segment.

tion.—Tropical and subtropical seas; often d

TO THE AMERICAN SUBGENERA AND SPECIES OF THE GENUS SE
e with a lateral tooth behind the outer orbital tooth.
with oblique, coarsely pectinated ridges on upper sur

Subgenus *Chiromantes*, p. 287; *afric*
without oblique, pectinated ridges on upper surface.

Subgenus *Se*
s converging anteriorly. Legs narrow and very long.

v
us with a definite marginal line above.
front more than half as wide as carapace.
Carapace deeply grooved.

1. Lateral margins nearly straight, curving in at the
About 11 strong blunt spinules on upper surface
finger-----*sulc*

2. Lateral margins sinuous. About seven to nine de
form tubercles on upper surface of movable finger.

reticu
Carapace slightly grooved.

- as joints of legs less than twice as long as broad.
front widening toward the lower margin.
Merus of third leg less than three times as long as w
¹. Upper margin of hand not a sharp crest.
G¹. Merus of third leg more than $2\frac{1}{2}$ times as long as
cin
G². Merus of third leg less than $2\frac{1}{2}$ times as long as
H¹. Carapace a little wider posteriorly than anterior
lobes prominent -----
H². Carapace wider anteriorly than posteriorly.
not prominent ----- *magdal*
². Upper margin of hand a sharp crest-----*occid*
Merus of third leg three times, or more than three t
as wide.
¹. Third leg $2\frac{1}{2}$ or nearly $2\frac{1}{2}$ times as long as carapace.
G¹. Deflexed front four times as wide as high. Fif
segment of male longer at middle than at sides
----- *miersii ih*
G². Deflexed front higher, less than 4 times as w
Fifth abdominal segment of male of even len
out----- *bic*
¹. Third leg twice as long as carapace-----
front not widening toward the lower margin, its sides
Carapace nearly square, its length nearly or quite
width.
¹. Carapace a little wider than long.
G¹. Manus without a definite marginal line above
proximal part.
H¹. Margins of merus joints of legs converging fro
toward the carpus joints ----- *anau*

subgenus CHIROMANTES Gistel (=PERISESARMA de Man).

with a lateral tooth behind the outer orbit; oblique, coarsely pectinated ridges on upper surfaces.

SESARMA (CHIROMANTES) AFRICANUM Milne Edwards.

Plate 75.

africana MILNE EDWARDS, Hist. Nat. Crust., vol. 2, p. 106 (1835); (locality, Senegal; type in Paris Mus.) ; Ann. Sci. Nat., vol. 20, 1853, p. 185 (151).

(*Periscesarma*) *africanum* RATIBUX, Proc. U. S. Nat. M., p. 280.

.—Large, hairy. Transverse ridge inside ham-
s about two and one-half times as long as wide.
on.—Carapace five-sixths as long as wide, a
e anterior angles; the four post-frontal lobes
pair wider than the outer pair; surface uneven,
ick ridges of hair. Lateral tooth strong; be-
tion of another tooth.

vertical, concave, its greatest height nearly one-
dth, lower edge very sinuous, sides subparallel
and rounded.

in the male much more massive and in the female
than the legs. Outer surface of arm and wrist
striae, outer surface of hand coarsely t-

mens.—Male (1160), length of carapace 7 mm.

—Barbados. West Africa, from Senegal to Ben-

al examined.—

los; 1 large female (Paris Mus.).

1; M. Delambre; 1 large female cotype, Paris Mus.; cat. No. 20281, U.S.N.M.

pring, Monrovia; Apr., 1894; O. F. Cook and C. H. Gilbert; 2 females (20572).

River, Elmina, Ashantee; Nov. 27, 1889; W. E. B. Dohrn; 1 male (14870); 1 female (14871); M. Duparquet; 1 small male, 1 large female (14872).

Subgenus SESARMA (=EPSESARMA de Man).

ce with a lateral tooth behind the outer one; without oblique, coarsely pectinated ridges on upper margin.

SESARMA (SESARMA) VERLEYI Rathbun.

Plate 76.

Sesarma (Sesarma) verleyi RATHBUN, Proc. U. S. Nat. Mus., 1912, 123, pl. 6 (type-locality, Mulgrave, Jamaica; holotype, No. 24940, U.S.N.M.).

agnosis.—Carapace elongate, narrowed anteriorly, about four times as long as wide.

Description.—Carapace nearly nine-tenths as long as wide;

1 third which has a straight, horny edge, tips
other.

ally long; the third leg is three and one-fifth
rapace; its merus is four times as long as wide
(as the carapace) are nearly naked, only the ma-
ints (proximal end of the propodus excepted) bear
ir with a few longer ones intermingled. The
inent lines of granules on the upper surface,
ch is continued somewhat obliquely on the ne-
in.

ts.—Female holotype, length of carapace 20, width
into-orbital width 16.5, width of front 9.1 mm.

examined.—Jamaica: Mulgrave (a small village
ty near Ipswich, St. Elizabeth); 1 female, he-
Miss Verley, and received through Mr. P. W.
D., U.S.N.M.

SESARMA (SESARMA) SULCatum Smith.

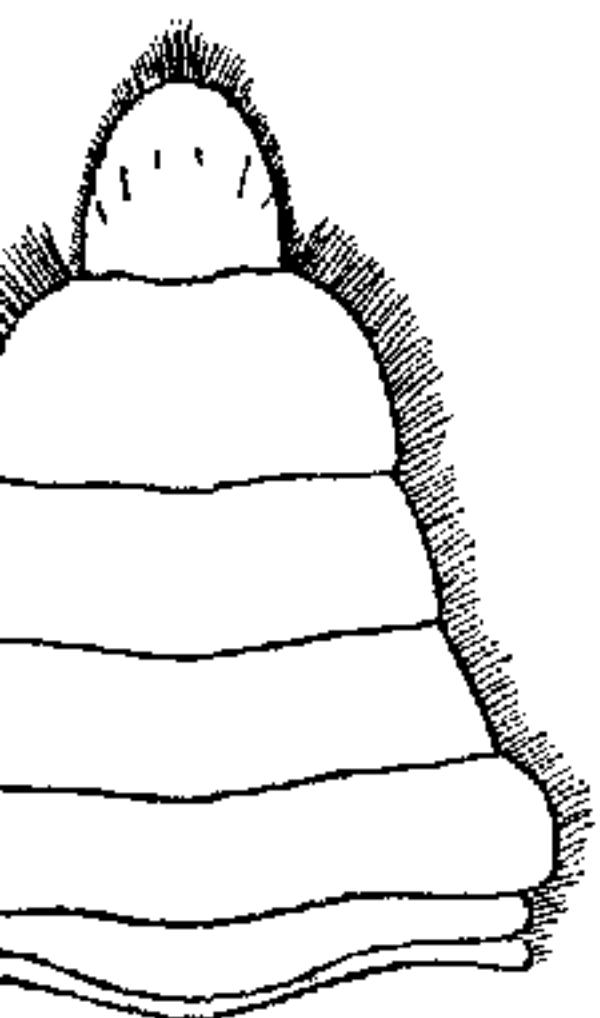
Plate 78, figs. 3 and 4.

Scata SMITH, Trans. Connecticut Acad. Arts and Sci.,
156 (type-locality, Corinto, west coast of Nicaragua
imp. Zool.).

—Carapace large, deeply grooved and hairy.
both acute. Eleven prominent blunt spinules

—Carapace about four-fifths as long as wide,

is very broad; third pair two and one-third times as long as the fourth, its merus two and one-third times as long as the femur, each with a strong subterminal spine above.



.—SESARMA (SESARMA)
RETICULATUM, ABDOMEN OF MALE
(♂), $\times 18$.

last three joints, with rows of small tubercles on margins of last two joints.

Terminal segment of male 4 times as long as broad.

Measurements.—Male (4631) carapace 33.3 mm., width of

Range.—From La Paz, California, Mexico, to Panama.

Material examined.—

La Paz, Lower California; 1 male (4631).

San Blas, Tepic, Mexico; 1 male (20653). Nelson and Goldman; 2 males (20653).

Monterrey, Nuevo Leon, Mexico; 1 female holotype (♀); 1 male (32315). Rio del Rio Jesus Maria, Costa Rica; Apr., 1905; 1 male (32315). Cristian; 1 male (32315).

Capitana, Canal Zone; H. Pittier; 2 males (4550).

SESARMA (SESARMA) RETICULATUM (Say).

Plate 77.

Hoplopyge reticulatus SAY, Journ. Acad. Nat. Sci. Philadelphia, p. 73, pl. 4, fig. 6 (type-locality, "muddy salt marshes near

o nine depressed spinules above on the basal two segments; a widish gap, and an enlarged tooth near each side of the middle joint; the palm is half again as high as its middle joint, with about four granules above near the base, the fingers

the third pair about twice as long as carapace, the fourth pair one-third times as long as wide. Subdistal spinules wanting; last three joints densely tomentose.

Length of abdomen a trifle longer than wide.

Material examined.—Male (New Haven), length of carapace 19 mm.

Specimens from Woods Hole, Massachusetts, to Calhoun, Georgia.

Burrows in muddy salt marshes.

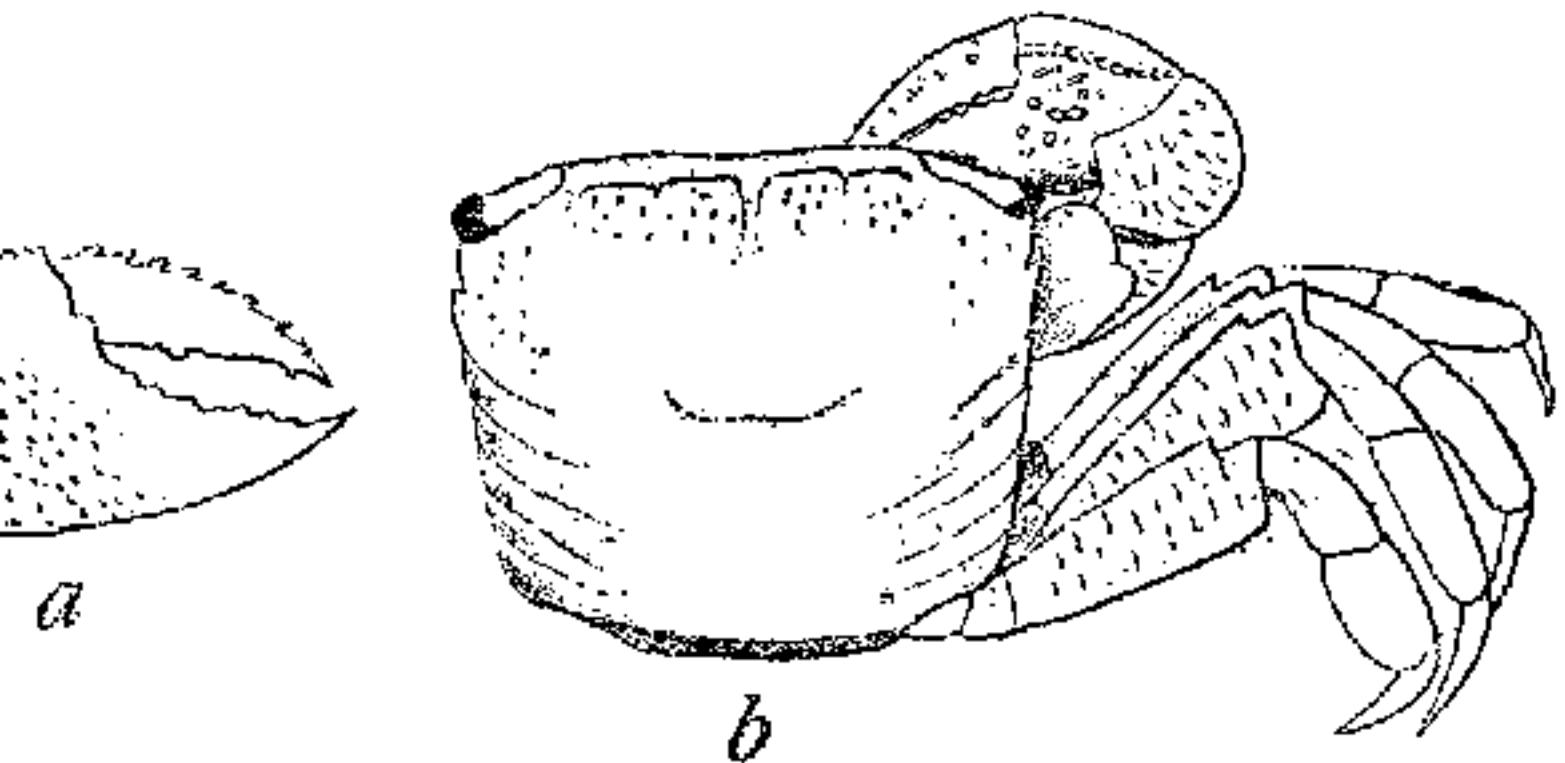
Color dark plum-colored or bluish-black, with a grayish ground, the grayish color showing very faintly on the anterior part. Upper part of chelipeds, as shown in figure, darkly colored, but brighter; upper part of legs and under part of palm yellowish. Under part of carapace grayish.

Material examined.—

Female, Massachusetts; July 10, 1901; V. N. Edwards, ovig. (45530).

Specimens from Woods Hole, Massachusetts; M. J. Rathbun,

arma aequatorialis ORTMANN, Zool. Jahrb., Syst., vol. 72, p. 23, figs. 14, 14 α , 14 β (type-locality, Ecuador; type in SMITHSONIAN MUSEUM).—Carapace narrowed behind. Side tooth on whole length of movable finger. Legs short.



46.—SESARMA (SESARMA) AEQUATORIALE, NATURAL SIZE. *a*, MALE, OUTER VIEW; *b*, DORSAL VIEW; *c*, ABDOMEN OF MALE. (N.M.N.)

Description (condensed from Ortmann).—Allied to *Sesarma* but carapace narrowing a little posteriorly; side tooth strong; lobes well separated, nearly equal; lower margin of palm concave at middle.

Surface of arm and wrist with transverse rows of tubercles; surface of arm granulate, distally with a small angle; upper margin sharply granulate. Inner angle of palm cristate, finely granula-

unctate, with scattered patches of tomentum. Almost obsolete. Front oblique, lower margin convex in front view. Side tooth well marked. Surface of arm and wrist rugose; upper margin flat near the distal end, inner margin tuberculous, margin finely granulate. Palm higher than middle length, outer surface coarsely pubescent, upper margin a line of fine granules, inner surface with tubercles on distal end, scattered granules elsewhere. Upper surface of dactylus with 7 to 9 depressed spinules. Fingers subequal.

Third leg a little more than twice as long as carapace, its merus two and one-fourth times as long as wide. Meral spine sharp; last two joints clothed with a thick tomentum, longer hairs interspersed.

Measurements.—Male (17678), length of carapace 12.2, width of same 15.1 mm.

Under fallen leaves and other rubbish among rocks. Very sluggish in its movements. (Jarvis.) Found in Bahia; Jamaica; Porto Rico; Curaçao; Bahia, Brazil. *Examined*.—

Bahia; June 2, 1900; Wm. Palmer and J. H.

Jamaica: P. W. Jarvis; 1 male. 1 female.

and legs densely tomentose. The middle pair are more prominent and much wider than the lower margin of front less convex in front acute. The granules on the upper surface of in number, are confined to the basal half. and more slender, the third leg being two and a half times long as carapace, with its merus two and a half times as wide; spine on the merus long and slender. Abdomen of male narrower, the appendages ending in long needle-like points.

Measurements.—Male type, length 10.9 mm., width

Habitat.—In the mud of mangrove swamps.

Locality.—Costa Rica; Boca del Jesus Maria.

Material examined.—Boca del Jesus Maria, Costa Rica; mud of mangrove swamps; Apr., 1905; J. F. Tristan; 1 male. Same place and date; Jan. 1906; J. F. Tristan and P. B.

SESARMA (SESARMA) CRASSIPES Cano.

Sesarma crassipes Cano, Boll. Soc. Nat. Napoli, ser. 1, vol. 24, p. 244 (type-locality, Pernambuco; type in Naples Mu-

Morphosis.—Rather narrow. Supra-frontal lobes equal, straight, tooth small.

Description (condensed from Cano).—Of medium size, rather narrow, its length 0.84 of its width. Supra-frontal lobes equal, straight, tooth small. Mesogastric area well defined, epigastri-

—Carapace narrowed anteriorly. Side toothed. Legs narrow.

—Distinctly narrowed from posterior to anterior; surface distinct, surface coarsely punctate, and towards granulate. Lateral tooth acute, behind it a small one.

half or a little more than half the fronto-orbital width, as wide as high, superior lobes well marked, lower margin zig-zag, the outer pair much narrower and higher than inner pair; lower margin sinuous, in dorsal view almost parallel.

of arm and wrist crossed by short granulate lines; near the distal end of the upper border of arm and wrist armed by spiniform tubercles; inner angle of wrist not swollen and tuberculate except near the fingers, which have a more or less interrupted line of granules; inner surface of fingers not tuberculate. Fingers narrow, irregularly gaping, the tips irregular, the largest one near the tip; upper surface spinulous for three-fourths its length.

Legs; third leg a little more than twice the length of the first, second about twice the length of the first, and is two and three-fourths times as long as wide, the tibiae spiniform; last two joints tomentose, especially the tarsus; claws strong.

Female. —Carapace broadly triangular.

Length of carapace 22.5 mm.

Plate 81.

Sesarma (*Sesarma*) *Jarvisi* RATHBUN, Proc. U. S. Nat. M
p. 124, pl. 7 (type-locality, Mount Diablo, St. Anns, J
male, Cat. No. 24941, U.S.N.M.).

agnosis.—Narrowed anteriorly. Sides of front o
l leg about three times as long as wide.

Description.—Carapace about four-fifths as long as w
rly, rather flattened; regions and supra-front
, outer pair of lobes very narrow. Surface irr
d sparingly covered with lumps each of wh
of tufts of hair. The oblique ridges usually
al regions are few and are broken into short i
t a little less than half as wide as carapace,
below, lower margin convex in front view, bil
Lateral tooth well-marked, blunt.

Chelipeds in the small type male are not much
surface of arm and wrist are finely rugulose, m
granulate or denticulate and not prominent. T
e (the specimen is perhaps not full grown);
few scabrous granules outside, a sharp crenulate
irregularly toothed within, nearly meeting;
ylus finely spinulous almost to the tip.

very slender, spine of merus acuminate, sur
ly hairy. Third leg about two and one-half ti

bed by a deep sulcus; mesogastric sulcus narrow, frontal lobes. Front one-fourth as high as wide, and bordered on its lower margin by a very prominent carina; in the middle is deeply emarginate; vertical surface of the lobes rather smooth. Frontal lobes disposed in a transverse line, straight as in most of the Sesarmas; the lobes are subequal, the lateral pair slightly larger, but instead of being concave, those of the median pair are convex and very prominent below; the margin of the lobes is without granulations, as common to the rest of the surface. Outer margin of the lobes inclined a little forward and outward; beneath each lobe minute teeth or rudiments of teeth of which the median pair is the best developed.

Merus very slender; merus rugose outside, its three fingers, the inner one with a small dentiform projection; palmus without inner projection, its surface coarsely granulated, somewhat convex outside, clothed with very distinct granules, inner surface apparently smooth, upper margin slightly elevated, more distinct in the male than in the female; fingers slender, longer than palm, teeth rather large, apices conical, the outer ones slightly curved.

Dactylus and slender; merus externally rugulose, length about twice width, upper margin bearing a strong acute tooth, the remainder of the margin unarmed; length of propodus about one and a half times that of dactylus, the latter slender and long-acuminate, apical spine strong.

joints of legs with a broad dilatation below, strong tooth. Next two joints short-hirsute, armed below with spinules.

Measurements.—Female type, length of carapace 6, of front 3.3 mm.

Place.—Payta, Peru.

genus **HOLOMETOPUS** Milne Edwards (=SESARMA de Mar-

pace without a lateral tooth behind the outer without oblique, coarsely pectinated ridges on

SESARMA (HOLOMETOPUS) RECTUM Randall.

Plate 82.

Sesarma recta RANDALL, Journ. Acad. Nat. Sci. Philadelphia (1840), p. 123 (type-locality, Surinam; male holotype Acad. Sci.).—ORTMANN, Zool. Jahrb., Syst., vol. 10, 1891, figs. 8 and 8a.

Sesarma mullerii A. MILNE EDWARDS, Nouv. Arch. Mus. Hist. vol. 5, 1869, p. 29 (type-locality, "Destero (Brésil); Mus.).

Diagnosis.—Large, coarse. Hands broad, a single line Merus joints of legs less than twice as long as

Description.—A large species. Carapace distinctly diminishing a little in width from front to ; surface rough with pits and transverse ridges;

carapace, its merus less than twice as long as last two joints tomentose.

ts.—Male (22839), length of carapace 26.4, width of chelipeds 20, width of front 18 mm.

om Trinidad, West Indies, to Desterro, Brazil. *S. rectum* is nearest *S. sulcatum*, a species with narrower and more hairy legs.

examined.—

Jan. 30–Feb. 2, 1884; *Albatross*; 1 male, 1

r. Hering; 1 male holotype (Mus. Phila. Acad. Sci., U. S.); 1 male (22839); 1 male (22840), Brazil: 1876–1877; R. Rathbun; 1 male (22841), Brazil: 1876–1877; R. Rathbun; 1 male (25711).

City of Bahia, Brazil; 1876–1877; R. Rathbun; 1

Bahia, Brazil; 1876–1877; R. Rathbun;

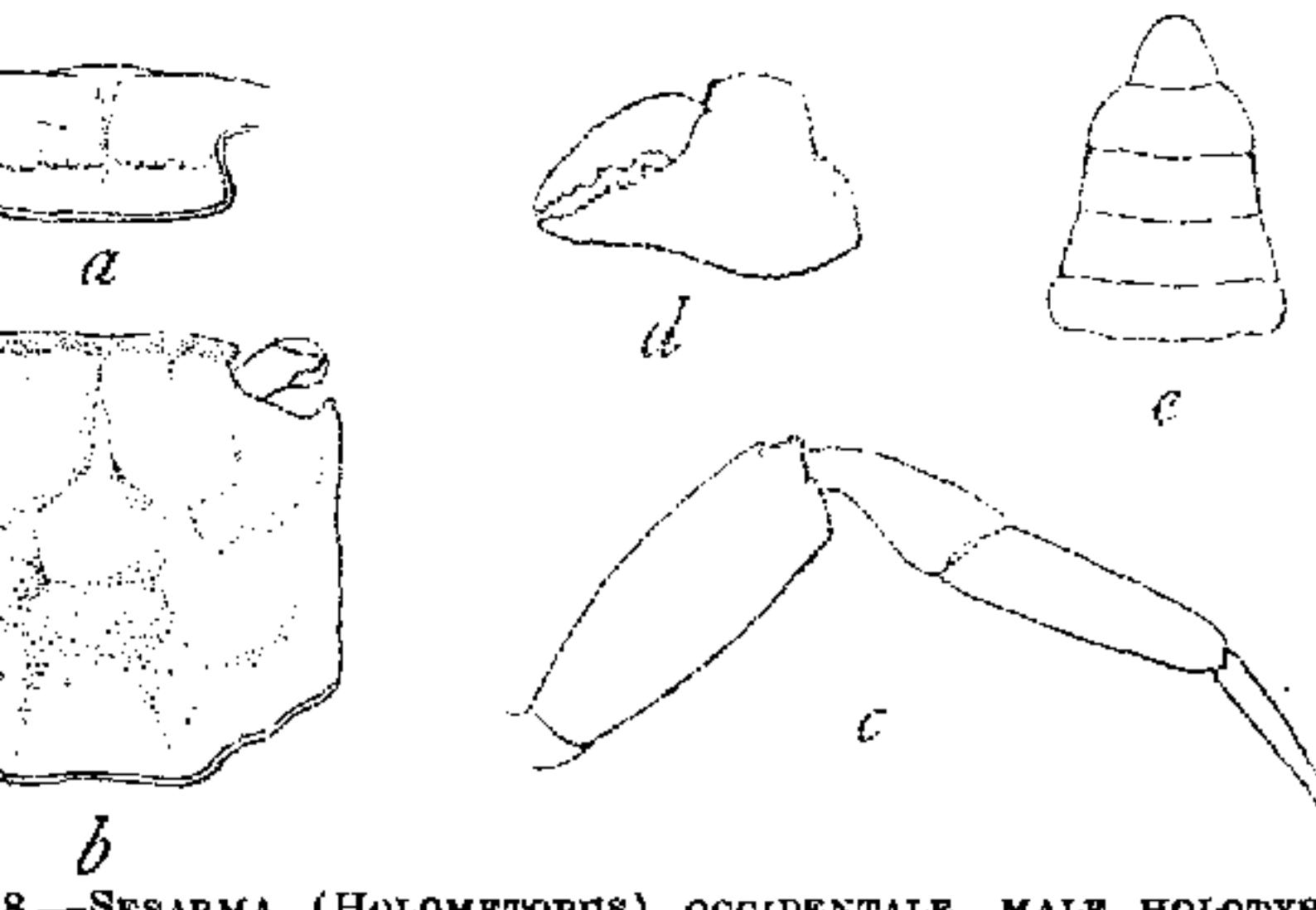
Caravellas, Bahia, Brazil; 1876–1877; R. Rathbun; 1

asahe, Rio de Janeiro, Brazil; Jan., 1912; E. G. M. (22842).

J. C. Thayer, Rio de Janeiro, Brazil; Thayer Exped.; 1 male (22839).

Trinita, Santos, Brazil; June, 1913; H. Ludewig; 1 male (47867).

granules; palm short, outer surface very granular, with a sharp crest.



8.—*SESARMA (HOLOMETOPUS) OCCIDENTALE*, MALE HOLOTYPE
OF FRONT, $\times 18$; b, CARAPACE AND EYES, DORSAL VIEW, $\times 1$
; d, LEFT CHELA, OUTER VIEW, $\times 18$; c, LAST FIVE SEGMENTS
; f, APPENDAGE OF FIRST SEGMENT OF ABDOMEN, $\times 7$.

and leg two and one-half times as long as carapace, three times as long as wide.

Measurements.—Male holotype, length of carapace 11.6, anterior width 16.9, width of front 9.4 mm.

Habitat.—Acajutla, Salvador; Panama (M. C. Z.) (Nobili).

Material examined.—Acajutla, Salvador; 1866; F.

heavy. Only the lower edge of the merus has upper edge sharp, inner edge irregularly denta- laminar expansion on the distal half. Inner a

Palm nearly twice its superior length. face is covered with fibrous granules that transverse lines on arm near the upper margin are arranged in oblique lines, but without strong ridges which the subgenus *Parase-* face coarsely granulated; prominent ridge at end. Pollex elongate; dactylus thickened somewhat dorsally flat-marked concavity below at base. The fingers ga the largest tooth of their applied edges is at the

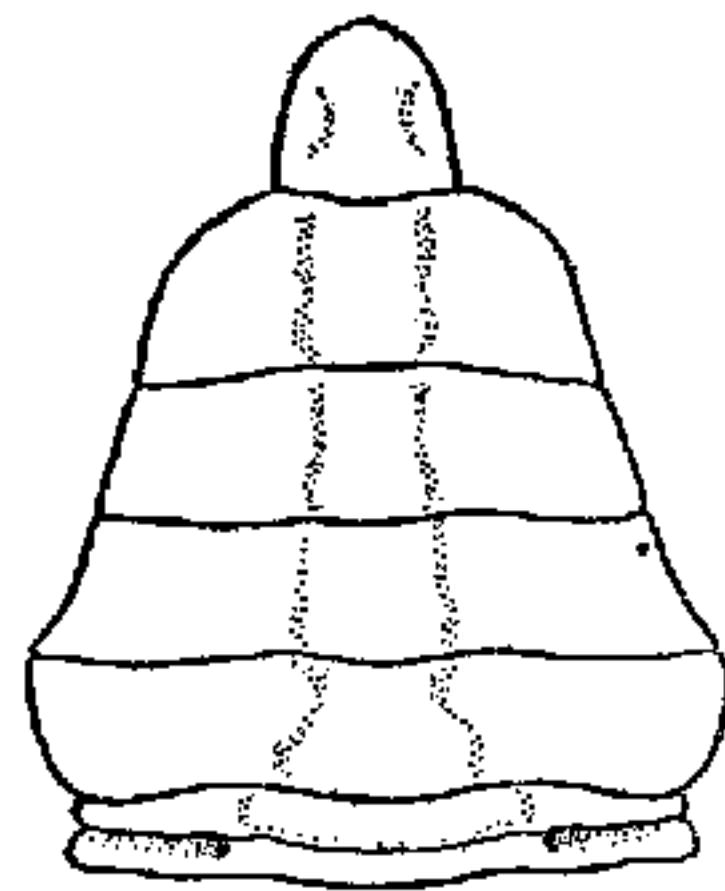


FIG. 149.—SESARMA (HOLCOCINEREUM, MALE (15072).
a, SIDE VIEW OF LEG; b, FIRST SEGMENT OF ABDOMEN, APPENDRAL VIEW, $\times 7\frac{1}{2}$.

narrow, a sharp spine near the end of the twice as long as carapace, its merus a little more half times as long as wide.

of male broadly triangular; the appendages of

nd Creek, Talbot County, Maryland; July 2
laker and W. D. Appel; 1 male, 2 females (1 ow
nt Lookout, Maryland; Aug. 25, 1880; Wm. P.
le (15098).

ths Island, Northampton County, Virginia;
nber, 1895; 1 male (18900). May 19, 1898; 1
(3). Dec. 24, 1898; one specimen from the be
under roots and logs well up on the beach abo
make holes in the sand"; 3 males, 5 females (2
ampton; Virginia; June 28, 1892; *Grampus*;
").

lyah Bay, South Carolina; January, 1891; *Fish*
17491).

rleston Harbor, South Carolina; Mar. 18, 1880
llies (3160).

st end Port Royal Island, South Carolina; Jan
; 1 specimen (17182).

gan River, South Carolina; around old palmet
Fish Hawk; 6 specimens (26138).

Johns River, Florida; G. Brown Goode; 3 sp
).

Augustine, Florida; H. S. Williams; 1 s
Y. U.).

uth of Indian River, Florida; 1874; E. Palme
Y. U.).

SESARMA (HOLOMETOPUS) MIERII Rathbun.

Plate 84.

angustipes Miers, Proc. Zool. Soc. London, 1881, p. 70; R. Video. Not *S. angustipes* Dana, 1852.

impsonii Miers, Challenger Rept., Zool., vol. 17, 1888 (locality, Monte Video; type in Brit. Mus.). Not *S. impsonii* Miers, 1881.

Holometopus) miersii RATHBUN, Proc. Biol. Soc. Washington, 1897, pp. 90 and 91 (type-locality, Abaco, Bahamas; J.S.N.M.).

—Little transverse. Front less than half width of third leg less than two and one-half times

.—Carapace a little broader than long, of equal width posteriorly. General appearance much like *S. punctatae* more numerous, the anterior granulations larger.

than four times as wide as high, widening a little at the front; frontal lobes those of the inner pair are very large, those of the outer pair.

Hands differ as follows from those of *S. cinereum*: the distal tooth on its upper margin; the laminar exopodite is widest nearer the end of the segment; coarsely granulate, being rough to the unaided eye. The fingers are thickened, the thumb

rial examined.—

o, Bahamas; *Albatross*; 10 males, 10 females (Island, Bahamas; Biol. Exped. State Univ. I. S. U. I.

Salvador, Bahamas; *Albatross*; 1 male, 4 females (Gerona, Isla de Pinos; July 11, 1900; Wm. Riley; 1 female (23815).

ego River, Montego Bay, Jamaica; Aug. 25; 2, male and female (41525).

n Islands, Caribbean Sea; C. H. Townsend; 1 male).

Parahyba do Norte, Cabedello, Brazil; on male; Branner-Agassiz Exped.; 1 male (25712).

le Janeiro, Brazil; Dr. Cunningham; 1 male (Mus.).

erro, Brazil; Fr. Müller; 1 male (20312).

SESARMA (HOLOMETOPUS) MIERII HERINGI, new subspecies

Plate 85.

-locality.—Bahia, Brazil, on the seashore; M. collector; from Carnegie Institution; male holotype, U.S.N.M.

agnosis.—Differs from typical *miersii* in having a more robust body and longer legs.

ities.—Approaches very near *S. biolleyi* of the

at first, diminishing posteriorly, a very narrow margin behind the antero-lateral angles. Surface smooth and shining, depressions moderately deep, few large scattered ones visible to the naked eye, small ones, which become crowded on the anterior and posterior margins. Anterior and antero-lateral regions thickly granulated. Antero-lateral angle a well-marked triangle, three-fifths as wide as carapace, surface nearly smooth, lower edge advanced; front widening below, outer corners rounded; surface uneven, with fine granules; middle lobe granulate with fine, depressed granules; sides nearly smooth and feebly separated, the middle lobe

male massive; merus and carpus covered on the outer side with short, granulated rugae; chelae high, swollen; fingers short, high, horizontal; dactylus strongly arched. Merus very arcuate, its upper surface with several transverse lines of fine granules, its outer surface, as well as that of the proximal half of the dactylus, covered with small granules; fingers punctate, gaping; basal half of the dactylus cut out in a deep sinus, into which fits the curved tooth of the immovable finger; both fingers

the both fingers are horizontal and longer than the fingers of the male; they do not gape and the teeth fit closely.

Plate 87, figs. 2 and 3.

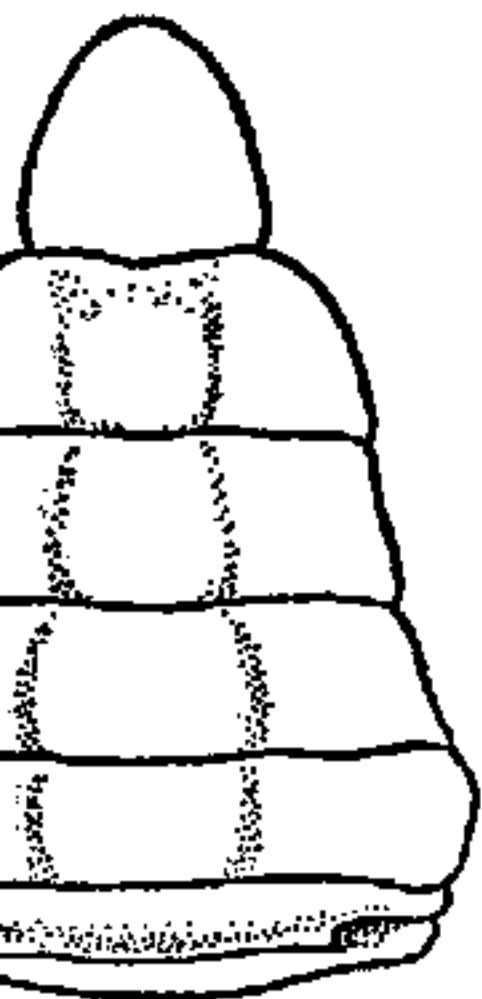
arma (Holometopus) biolleyi RATHBUN, Proc. Biol. vol. 19, 1906, p. 100 (type-locality, Salinas de Caldera Maria, Costa Rica; holotype male, Cat. No. 32490, U.

agnosis.—Narrowed anteriorly. Front half width of third leg three times as long as wide.

Description.—Carapace about one-half longer than long and broader behind. Surface very uneven, densely granulated, granules punctate and wrinkled posteriorly. Lower edge projecting below, lower edge projecting in front view, slightly sinuous. Superior lobes more transversely elongated than in *S. miersii*, sharply marked than in the preceding species. Upper margin of orbit sinuous, outer tooth acuminate.

Chelipeds rugose, the rugae tubercles or granules on the fingers and the palm; the latter much infuscated, sparingly granulous, a transverse band near the distal end.

Prehensile teeth of fingers larger than in *S. miersii*. Inner laminar expansions of chelipeds cut into jagged teeth.



0.—*SESARMA (HOLOMETOPUS) BIOLLEYI*, AB-
N. OF MALE HOLO-
TYPE X 3½.

Merus joints of legs converging slightly from
—Carapace perceptibly wider than long, of
oughout, though widening slightly behind. S
coarsely punctate at the middle, finely punc
the branchial and intestinal regions, the p
more or less connected by fine grooves; sur
frontal region and antero-lateral angles
granulate; postero-lateral grooves fine.

Supra-frontal lobes deeply separated, t
dian groove larger than the lateral grooves
dle pair of lobes transversely arcuate; out
narrower, oblique, trending forward toward
orbit. Front relatively broad and low,
five times as wide as high, sides vertical;
margin arcuate in front view, sinuous in
view, surface concave in both directions;
per margin of orbit nearly straight, up
short, acute tooth at the outer angle of the

Merus of cheliped covered with gran
rugae on its outer face; lower outer margin
a well-marked subdistal tooth; tooth on
margin nearly obsolete; inner margin denti
ed and bearing a large tooth. Upper surface of
surface of merus. Palm massive in the full
size, its length 1

of same (at base of second leg) 17.3, width of orbit 17.2, width of front 9.4 mm.

Habitat.—Lives in the soft mud of the river banks.

Range.—Known only from the type-locality.

Material examined.—Tampico, Mexico; June 1, 1871; 4 males, 1 of which is holotype (45794).

SESARMA (HOLOMETOPUS) RICORDI Milne Edwards

BEACH CRAB.

Plate 89.

Sesarma ricordi MILNE EDWARDS, Ann. Sci. Nat., ser. 3, p. 183 [149], (type-locality, Haiti; type in Paris Museum);
Sesarma guerini MILNE EDWARDS, Ann. Sci. Nat., ser. 3, p. 183 [149], ("*patrie inconnue*"; type in Paris Museum);
Sesarma miniata SAUSSURE, Mém. Soc. Phys. Hist. Nat. 1858, p. 442 [26], (type-locality, Saint-Thomas; cotype in Paris Museums).

Sesarma angustipes STIMPSON, Ann. Lyc. Nat. Hist. New York, p. 66 (in part, at least). Not *S. angustipes* Dana, 1851, Connecticut Acad. Arts and Sci., vol. 2, 1870, p. 15 (Leyden Mus., vol. 14, 1892, p. 253, pl. 10, fig. 5).

Sesarma stimpsonii MIERS, Proc. Zool. Soc. London, 1886, p. 11 (locality, Florida and the Tortugas; type in Brit. Museum); *Sesarma stimpsonii* Miers, 1886.

Sesarma cinerea HEILPRIN, Proc. Acad. Nat. Sci. Philadelphia, 1871, p. 10 (Not *Sesarma cinerea* (Bosc)).

Sesarma cinerea IVES, Proc. Acad. Nat. Sci. Philadelphia, 1871, p. 10.

umb, finely granulate outside, granules thickened.
Fingers with a wide aperture at base, the dactylus hollowed out; the largest prehensile tooth is near the pollex and is much thickened. Inner surface of fingers acute.

third pair about twice as long as carapace, its length as long as wide.

appendage of first segment of male abdomen longer than in the allied species.

ge or reddish-yellow, finely speckled by the carapace; feet often marbled (Saussure). Deep sea fishable (A. E. Verrill).

g.—Male (13798), length of carapace 19.5, greatest width 0.1, anterior width 19.1, width of front above 10. Found along shore, under logs of driftwood, and among floating seaweed, nearly up to high-water mark. Found in bays about 50 yards from high-tide mark (Miller). From Southern Florida and Bahamas to Rio de Janeiro, Brazil.

nined.—

, south of South Bight, east side of Andros Island, Bahamas; May 3, 1912; Paul Bartsch; 4 males, 4 females.

Lakewood, Kissimmee, Florida; A. M. Reese; 11 males, 13 females.

Providence, West Indies; Apr. 4-9, 1884; *Albatross* (17645).

açao; Feb. 10-18, 1884; *Albatross*; 1 male, 2 females (23812). Sanilla, Colombia; Mar. 16-22, 1884; *Albatross* (17645).

Cabañas, Cuba; William Palmer and J. H. Riley; along shore; June 3, 1900; 3 males, 1 female (23813); 1 female (23812).

La Ciénaga; 1914; Henderson and Bartsch, *Tomas Echegaray*; May 20; 7 males, 10 females (2 ovig.) (23814). Cabañas; June 7; 1 male (48581). Cabañas; on sand bottom; June 8; 1 female (48616); 1 female (48617).

La Ciénaga, Cuba; June 10, 1900; William Palmer and J. H. Riley; 1 male (23813).

Montevideo, Uruguay; M. S. Roig; 1 male (46086). Montego Bay, Jamaica; P. W. Jarvis; 1 male, 1 female (23815). Falmouth Harbor, Jamaica; Mar. 1-11, 1884; 1 male (23816). T. H. Morgan; 1 female (17227).

Jamaica; Mar. 1-11, 1884; *Albatross*; 12 males, 27 females (23817). Ricord, collector; type (Paris Mus.).

Puerto Rico; 1899; *Fish Hawk*; Porto Real; Jan. 27, 1899; 1 male, 2 females (24034). Boqueron Bay; Jan. 27; 1 male, 2 females (24035). Ensenada de la Guanica; Feb. 14; 3 specimens (24035). Ensenada de la Guanica; Feb. 14; 9 males, 11 females, 6 y. (24047).

Thomas: Sausseure, collector; 1 octotype of *S.*

atlas, 1855, pl. 22, fig. 7a-c; (type-locality, South extant).

ericana SAUSSURE, Mém. Soc. Phys. Hist. Nat. Genève 441 [25] (type-locality, St. Thomas; cotypes in Gene-

-Sides of front parallel. Exorbital toothed; width of legs diminishing slightly from middle to distal.—Carapace considerably narrower anteriorly than length subequal to anterior width; surface posteriorly rough with granules arranged mostly

lateral lobes deeply separated from one another, not much wider than those of the outer pair. Carapace half times as wide as high, sides parallel, low, a broad and deep median sinus in dorsal view. Angle of orbit acute but not prominent.

Expansion on the inner margin of the arm-claws male dentiform. The swollen palms are tubercles inside and out; no definite marginal line above them on outer and inner surface, gaping their whole length toothed, the largest tooth being one not far from the tip of each finger.

Merus little more than twice as long as carapace, it is three times as long as wide. The merus joints equal in length from the middle to the distal end.

Claws of male subtriangular; appendages narrow and pointed at the extremity.

ze, British Honduras; Mrs. F. E. D. Meek
n Creek; British Honduras; found in a hole
bank of the river; Rev. W. A. Stanton; 1 female
a, Honduras; Sept. 29, 1916; F. J. Dyer; 1
).

town, Nicaragua; Feb. 12, 1892; Chas. W.
2 females (19417).

entral America," probably; from a bunch of banana
District of Columbia; R. W. Brown; 1 female
st coast of Central America," locality proba
17295).

SESARMA (HOLOMETOPUS) ROBERTI Milne Edwards

BRACKISH-WATER CRAB.

Plate 91.

Sesarma roberti MILNE EDWARDS, Ann. Sci. Nat., ser. 3, Zool.,
p. 182 [148], (type-locality, Gorée; type in Paris Mus.)
Sesarma americana POCOCK, Ann. Mag. Nat. Hist., ser. 6,
Not *S. americana* SAUSSURE, 1858.

Sesarma bromeliarum RATHBUN, Proc. U. S. Nat. Mus.,
143 (type-locality, Rio Cobre (St. Catherine), Jamaica).
Cat. No. 19408, U.S.N.M.).

agnosis.—Length greater than anterior width.
All. Merus joints of legs of even width in the

26.3, anterior width 24.7, width of front 14.1. Lives on steep muddy banks of rivers in small burrows in the soft earth at the water's edge. Eats when alarmed. Found in most of the rivers where the water is brackish (Jarvis); also on many West Indies. Turbo, Panama (M. C. Z.). Also

examined.—

uba; Feb. 1, 1902; Wm. Palmer; 1 female (2555) (St. Catherine), Jamaica; P. W. Jarvis; 1 male (*romeliarum*), 1 female (19406); 2 males, 2

Jamaica; E. A. Andrews; 1 female (17003). Congo, West Indies; 1878; W. M. Gabb; 1 male (1878) (Biol. Survey, U. S. Dept. Agriculture; Analysis of bird stomachs; specimens in collection of Bishop, collector (4801, Berlin Mus.)).

West Indies; A. H. Verrill; 1 male (32715).

inica; J. G. Ramage; 12 specimens (88.26, Brit.

M. A. Rousseau; 2 females (Paris Mus.)).

es, St. Lucia; *Albatross*; 2 males, 1 female (221)

egambia; M. Robert; 1 male, 1 female (c.)

SESARMA (HOLOMETOPUS) FESTAE Nobili.

ral aspect of carapace rather flat, only feebly
Mesogastric sulcus narrow, but reaching from
sulcus runs at right angles toward the supero-
orbit. Gastro-cardiac sulcus deep.

pedes rather slender. Merus outwardly rug-
acute and denticulate; lower angle also conspicu-
fero-inner angle dilated toward the apex and be-
oth or denticulate projection. Carpus coars-
inner tooth or prominence. Hand rather sw-
with rather large granules; granules of inner
ed and less crowded; no trace of an inner crest;
by a denticulate crest. Palm shorter than fing-
htly dentate, leave a small gape when closed, th-
ghtly excavate.

long and slender; penult pair notably longer than
from two and one-half to three times as long as
podus one and one-half times as long as the
icles bear a small, denticulate crest above a
se on the posterior surface; the merus has at
acute tooth directed forward. Dactylus and
us bear a few short setae. (After Nobili.)

urements.—Male cotype, length of carapace 7,
nd ambulatory legs $8\frac{1}{2}$, width between exorb-
f front 4.5 mm.

re—Colombia (Pacific coast) and Ecuador.

les on wrist and swollen hand. Arm with a spine on the inner margin. Fingers little gaping, is not very unevenly dentate.

and narrow, third pair two and one-third times its merus two and two-thirds times as long, narrowing from the middle toward the distal end of male oblong-triangular, appendages of first pair armed in their terminal third.

Measurements.—Male (32314), length of carapace 14.4, anterior width 13.9, width of front 7.5 mm.

From Costa Rica (west side) to Bay of Panama; lives in mangroves (Tristan).

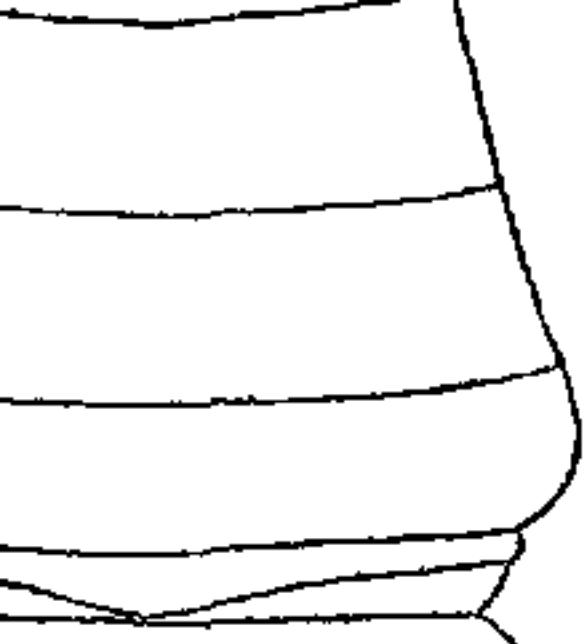
Examined.—

1 ♂, 2 ♀s, Costa Rica; 1 male, 2 females (Copenhagen); Jesus Maria, Costa Rica; Apr., 1905; P. Bingham; 1 male, 1 female (32314).

Bocas del Tingo, Gulf of Dolce, Costa Rica; Apr., 1896; 1 female (19437).

Island, Bay of Panama: May 12–15, 1911; 1 male, 1 female ovig. (44175). June, 1914; J. Zeteki.

Islands, Bay of Panama; 1866; F. H. Bradley; 1 male (M.Y.U.).



4



1

—SESARMA (HOLOMETOPUS) HANALE HOLOTYPE. ♂, ABDOMEN, $\times 4\frac{1}{2}$; ENDOGENE OF FIRST SEGMENT OF ABDOMEN, $\times 5\frac{1}{2}$.

width of same 16.6, posterior width of same 1
front 9.5 mm.

—West Indies. Only one specimen known.

SESARMA (HOLOMETOPUS) BENEDICTI Rathbun.

Plate 93.

ma recta DE MAN, Notes Leyden Mus., vol. 14, 1892, p. 4d; Surinam. Not *S. recta* RANDALL, 1840.
ma (*Holometopus*) *benedicti* RATIBUN, Proc. Biol. Soc. vol. 11, Apr. 26, 1897, p. 90 (type-locality, Surinam; us.).

na chiragra ORTMANN, Zool. Jahrb., Syst., vol. 10
type-locality, Para; type in Mus. Phila. Acad. Sci.)
life of Crustacea, London, 1911, pl. 23 (facing p. 182).

one-half times as wide as high; the dactylus is very long, so that its lower margin is very convex, indicating the palm. The fingers gape for their better use, and are particularly toothed on the distal half.

ents.—Male (22838), length of carapace 18.5, same 21.3, posterior width of same 20, width

Key West, Florida (M. C. Z.). Guiana to Rio de Janeiro (M. C. Z.).

xamined.—

British Guiana; 1 male, 1 female (Brit. Mu., Brazil; Thayer Exped.; received from Mu., 1 female (22838).

zil; Dr. T. B. Wilson; 2 males, 1 female, cotyledons. Phila. Acad. Sci.).

Genus METOPAULIAS Rathbun.

s RATHBUN, Proc. U. S. Nat. Mus., vol. 19, 1896, p.
ressus Rathbun.

perfectly flat. Supra-frontal lobes subtriangular, unnotched.

in *Sesarma* in having the carapace perfectly flat, and the lateral angles, where it is destitute of oblique lines.

regions deeply delimited. Surface densely granulated; toward the front there are sparsely distributed granules.

Abdomen a little less than half as wide as carapace, about one and one-half times as wide as high, very concave in both directions, surface nearly smooth; supra-frontal tubercles strongly projecting, deeply separated, either subequal or the outer slightly truncated, those of the inner pair most prominent, those of the outer pair at the outer angle; lower margin much wider than that of the upper margin, forming lobe either side, beyond which a shallow depression bounded by a rounded outer angle.

Upper margin of orbit concave; outer angle acuminate. Lateral tooth subrectangular.

Legs equal, of moderate size; outer surface of a leg granulated by very short granulated lines; on the palm, the fingers elongated in short ridges at the proximal end, becoming granulated except near the distal end of the outer surface.

Upper margin of arm granulate; lower and outer margins, the latter with a small triangular expansion. Fingers long, rather narrow, prehensile edge of each finger and nearly meeting. Dactylus granulate about one-half.

Leg two and one-half times as long as carapace, three and one-half to four and one-half times as

; P. W. Jarvis; 3 y. (19426).

Manchester; P. W. Jarvis; 1 female holotype (1 from water in crowns of Tillandsias, Bromel H. G. Hubbard; 1 female, 13 y. (45519). At; found in water that collects in the wild pine ris; 1 female (32367).

. W. Jarvis; 3 females (24939).

record.—Ewarton, Jamaica, "the only place entiful" (Jarvis).¹

Genus METASESARMA Milne Edwards.

a MILNE EDWARDS, Ann. Sci. Nat., ser. 3, Zool., vol. [154]; type, *M. rousseauxii* Milne Edwards.

cluded from orbit. Front vertical.

In *Sesarma*, in having the tooth at the lower inner corner meet the front near its lower angle, so as to exclude the orbit. The reticulation of the under side finer, closer, and more confused.

especially deflexed and deep. Supra-frontal tubercle

through the Indo-Pacific region and the east coast of South America.

METASESARMA RUBRIPES (Rathbun).

granulate; lower edge convex and lightly sinuate; angle of orbit blunt and short. No lateral tooth on surface of chelipeds coarsely roughened except regular expansion of the distal half of the inner margin, cut into jagged teeth on its distal margin. Abacule and finely granulate but not in a single row; very rough above, for two-thirds its length. Propodus irregularly toothed, narrowly gaping, short, broad and flat; third pair less than twice as long as wide, twice as long as wide. Margins of last two pairs of legs hairy.

urements.—Male (1940), length of carapace of carapace 20.7, posterior width of same 16.7, l.

e.—From Greytown, Nicaragua, to the Rio de
arks.—This species has a suspicious resemblance
um Dana¹ said to inhabit the Hawaiian Islands
here.

trial examined.—

town, Nicaragua; Feb. 8 and 12, 1892; Chas. W. females (19420).

una, Paparo, Venezuela; H. Pittier; 1 male (46) dad; Jan. 30–Feb. 2, 1884; shore; *Albatross*.

Nat. Sci. Philadelphia, vol. 5, 1851 (1852), pp. 241 and
sum Dana; U. S. Expl. Exped., vol. 13, Crust., pt. 1, 1858
MILNE EDWARDS, Ann. Sci. Nat., ser. 3, vol. 20, 1858,
type, *M. curvatus* Milne Edwards.

in *Sesarma* as follows:

front, instead of being abruptly and vertically
declivous and obliquely deflexed.

Postero-lateral borders are usually arched instead
of straight line with the postero-lateral borders.

Abdomen of the male does not completely coincide
with the sternum at the level of the last pair of legs;
the terminal segment is not deeply impacted
into the segment.

Hab.—West Indies; west coast of Africa; Indo-Philippines.

SARMATIUM CURVATUM Milne Edwards.

Plate 95.

curvata MILNE EDWARDS, Hist. Nat. Crust., vol. 2, 1858, p. 13
(locality, Senegal; type in Paris Mus.).

placca HERKLOTS, Addit. Fauna Afr. Occ., 1851, p. 10, pl. 1
(locality, Boutry; type in Leyden Mus.).—DE MAN, Not. Zool.,
vol. 2, 1880, p. 31.

s curvatus MILNE EDWARDS, Ann. Sci. Nat., ser. 3, vol. 20, 1858
[155].

s pectinatus MILNE EDWARDS, Ann. Sci. Nat., ser. 3, vol. 20, 1858
[155] (type-locality, Martinique; type in Paris Mus.).

curvatum KINGSLEY, Proc. Acad. Nat. Sci. Philadelphia,

are nearly smooth.

thick; merus joints with a subdistal spine long-pointed, subequal to the propodal segment.—Violet.

Measurements.—Male (20309), length of carapace .5, width of front 13.8 mm.

Localities.—Martinique, West Indies; west coast of Africa examined.—

nique; 1 male dried, type of *M. pectinatus* (Par-

gal; 1 male type (Paris Mus.).

o; Dybowski coll.; 1896; 1 male, 1 female (20309) (Paris Mus.).

Remarks.—The type-specimen of *Metagrappus pectinatus* in the Paris Museum has been compared with a typical specimen of *A. curvata* from Senegal. The crest on the hand is more prominent than on the former, but the specim-

Genus ARATUS Milne Edwards.

Aratus MILNE EDWARDS, Ann. Sci. Nat., ser. 3, Zool., vol. 15 [153]; type, *A. pisonii* (Milne Edwards).

narrow behind. Antenna excluded from orbit; subcircular.

pace trapezoidal, strongly narrowed behind. Vertical, reaching nearly to buccal cavity, concave. Epistome very short, fore and aft. Ant-

Sides entire. Claws bristly outside.

—Carapace nearly as long as wide; width at the second foot three-fourths as great as width of orbit. Sides acute, entire. Regions deeply mottled, with fine granules; branchial regions obliquely striated, these and densely punctate; gastric lobes and surrounding skin with fine sharp granules; otherwise the carapace uniform, appearing smooth, excepting the mottling, to the naked eye.

Front of carapace concave, its four lobes well separated by deep grooves; outer lobes wider than inner, covered with fine granules, inner lobes narrower than outer, with a few small tubercles, another narrower pair. Front nearly vertical, width about twice as high, sides parallel, lower edge with

one tooth short, acute.

Arms of moderate size, palms swollen. A spine on inner side of merus. Outer face of merus and carpus covered with fine granules. Inner margin of arm spinulous, distal half excepted. Carpus narrow-oblong. An oval area on the outer side of each radius and ulna is covered with tufts of long black bristles. Fingers irregularly toothed, the first two thin and without. Fingers irregularly toothed.

Legs very thin and flat, a terminal and a basal spine on each finger; last two joints hairy on margins, propodi and pretarsi hairy above.

Third leg one and two-thirds times as long as the second, pretarsus a little more than twice as long as wide.

Length 1.5 mm., width 1.1 mm. (Type).

te (28905).
Florida, Florida; 1884; Edward Palmer; 1 m.
a Rassa, Florida; mangrove swamp; February
hill; 24 males, 11 females (6434).

Gasparilla Pass, Florida; March 17, 1889;
15263).

g Boat Key, Florida; March 25, 1889; *Gram*
s (15262).

ma Sola, Florida; 1884; Edward Palmer; 1
au, Bahamas; December 25, 1898; *Fish Ha*
).

Arroyas, Cuba; May 20, 1914; Henderson and E
a Exped.; 10 males, 7+ females (48574).

el, Cuba; on bushes and wharves; May 10, 1906;
H. Riley; 3 males, 9 females (23809).

nias, Cuba; on rocks and piles along shore; Jun
r and J. H. Riley; 3 males, 4 females (23810).

ma, Pinar del Rio, Cuba; on piles; Mar.
r and J. H. Riley; 1 female (23633).

nguez, Porto Rico; fresh water; Jan. 20, 1899;
les (24050).

o Real, Porto Rico; Jan. 27, 1899; *Fish Ha*
).

uron Bay, Porto Rico; Jan. 27, 1899; *Fish Ha*
).

ares, Porto Rico; Feb. 14, 1899; *Fish Haw*

Genus CYCLOGRAPSUS Milne Edwards.

MILNE EDWARDS, Hist. Nat. Crust., vol. 2, 1837, p. 1.
tatus Milne Edwards.

maculatus MACLEAY, Zool. S. Africa, Annulosa, 1838, p. 6.
punctatus MacLeay, 1838 = *C. punctatus* Milne Edwards, 1837.
with the front and antero-lateral margins forming a V, the postero-lateral margins subparallel, posterior margin with several teeth. Surface flat, except anterior third, which is little marked and almost smooth.

and orbits occupy more than two-thirds the width of the head; front between one-third and one-half width of cephalothorax, of front nearly transverse. Orbita transverse, separated by the eyes.

of the side walls are stouter and the granules larger than in *Sesarma*. Antennules transverse; antenna with orbital hiatus. Epistome short, fore and aft. Gape wide, gaping anteriorly. Maxillipeds widely gaping, the palpus articulating on the anterior angle.

Gaster massive in the male, subequal, nearly equal in length, fingers pointed. Legs narrow, of moderate length.

With seven segments in each sex, in the male not exceeding the breadth of the sternum between the last pair of legs. Subtropical American & tropical Pacific to Australia.

Description.—Carapace three-fourths as long as sulcus present; surface punctate and around margins finely granulate; margin a raised one, in dorsal view, appears faintly bilobed; straight. Upper margin of orbit slightly sinuous inward and outward. In lower border of orbit below is a deep sinus from which a very shallow depression extends inward. Maxilliped broad, ischium and merus subequal, short and broad, outer surface finely rugose, and a little rough along the inner margin, higher than its superior length, margined above at the proximal end; on inner face, a few tubercles, a cavity. Fingers moderately gaping, feebly

and pair of legs twice as long as carapace. Entelesia second and third legs densely fringed with long setae, partly rugose, with a low subterminal tooth and pubescent.

Abdomen of male narrow-triangular; appendages long and narrow.

Measurements.—Male (15071), length of carapace 15.4, fronto-orbital width 10.6 mm.

Habitat.—Among rocks and dead seaweed near high-water mark. In marshy places near the sea, where it forms dense patches.

Colombia; Mar. 16-22, 1884; *Albatross*; 1369).

CYCLOGRAPSUS CINEREUS Dana.

Plate 98.

Cyclograpsus cinereus DANA, Proc. Acad. Nat. Sci. Philadelphia, 1851, p. 100; type-locality, *Ad oras Chilenses*; type from Valparaiso Zoöl.; female paratype, Cat. No. 2340, U.S.N.M.) ; U.S. Natl. Mus., vol. 13, Crust., pt. 1, 1852, p. 300; atlas, 1855, pl. 23. *C. punctatus* KINAHAN (not Milne Edwards), Journ. Anat., vol. 1, 1857, p. 342.

—Surface of front smooth. A deep postorbital furrow extending backward from the carapace to the merus joints of legs.

♂.—Narrower than *C. integer*, length about five times width of carapace. Surface of front smooth; granules only near the mouth. A deep furrow extends backward from the carapace to the merus joints of maxillipeds narrower than in *C. integer*. Carapace less than twice as long as carapace. No tooth on the anterior margin of the carapace; last two joints sparingly hairy, the propodus hairy on the distal half of lower margin. No unusual hairs on the second and third legs.

♀.—Carapace of male suboblong, except for the last segment which is very stout, narrowing at the extremity.

Measurements.—Ovigerous female (13866), length of body 13.8, width of body 9.1 mm.

Habits.—From Panama (M. C. Z.) to Lota, Chile. Hawaiian Islands.

osis.—Edge of front plainly visible in dorsal val sulus. Tooth on merus joints of legs. D. t.

Description.—Carapace larger and more uneven than in *C. integer*; length about four-fifths of width; one half, four large pits on each side in antero-lateral regions with uneven punctation; less deflexed than in *C. integer* or *C. punctatus*; upper margin visible in dorsal view; width two-fifths width of carapace. Outer lobe blunt; lower margin very incomplete. A short process leads backward from it under the margin.

-**CYCLO-**
PUNCTA-
TUS MAX-
ED., EN-
(AFTER
EDWARDS.)

Ischium of outer maxilliped narrower than in *C. integer*.

Chelipeds very strong. Wrist and fingers smooth. A prominent longitudinal groove on the upper surface of the chela. Prehensile teeth feeble, upper edge of pollex slightly convex. Length of chela one and three-fourths times as long as carapace. Propodus of second leg with a feeble subterminal tooth; dactyli and fingers smooth. The anterior edge of the propodi short-pilose; distance between bases of second and third legs; dactyli of second leg very short.

Abdomen of male tapering gradually from the third segment, this part of the margin being concave.