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THE OXYSTOMATOUS AND ALLIED CRABS OF AMERICA

BY

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The present work forms no. 166 of the *Bulletin* series.

ALEXANDER WETMORE,
Assistant Secretary, Smithsonian Institution.

WASHINGTON, D. C., *September 1, 1937.*

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THE OXYSTOMATOUS AND ALLIED CRABS OF AMERICA

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INTRODUCTION

This volume is the fourth of a series of handbooks on American crabs; the others are United States National Museum Bulletins 97, 129, and 152, on the grapsoid, spider, and cancroid crabs of America, respectively. The introductory remarks in those bulletins relating to sources of material, special researches, acknowledgments, and glossary of terms apply to the present work also.

In recent years the most fruitful expeditions, so far as collecting American crabs is concerned, were those of the *Velero III* on the Pacific coast, sponsored by Capt. G. Allan Hancock.[1] In consequence, 16 new species or subspecies have been added to the groups here described. Various stops were made in Mexico, Costa Rica, Panama, Ecuador, Peru, and the Galapagos Islands, where Crustacea were collected by Dr. W. L. Schmitt, Dr. C. M. Fraser, Dr. H. W. Manter, Dr. W. R. Taylor, John Garth, and Fred Ziesenhenne. Dredging was carried to a depth of 150 fathoms. New Pacific forms were obtained by Steve A. Glassell and Herbert N. Lowe, especially at the head of the Gulf of California, which, it appears, has developed a fauna of its own. We have also benefited through the courtesy of the California Academy of Sciences, which has loaned material obtained by the Crocker expedition on the *Zaca*. Dr. Manuel Valerio, of San Jose, has from time to time added to our knowledge of the Costa Rican fauna.

The Museum also has been enriched by vast collections of crabs from South America obtained by Dr. Waldo L. Schmitt in the course of two extended series of explorations in South American waters under the auspices of the Walter Rathbone Bacon scholarship. Besides the material collected, Dr. Schmitt was able to arrange advantageous exchanges with various South American museums and when that was not feasible to borrow specimens for study. In this way many gaps in the National Museum collections were filled, both as to species and numbers, and our knowledge of the fauna greatly increased.

[1] We are indebted to Captain Hancock for permission to publish these records in advance of the formal publication of the results of the expeditions.

On the Atlantic coast the Carnegie Marine Biological Laboratory at Tortugas, Dr. William H. Longley, director, has enlarged its scope, enabling Dr. Schmitt and others to make expeditions to deeper water than previously. The results have added notably to our knowledge of the fauna of the region. The Johnson-Smithsonian expedition of 1933 to the Puerto Rican Deep, Dr. Paul Bartsch, naturalist, secured a goodly number of Gymnopleura and Oxystomata, including an un-

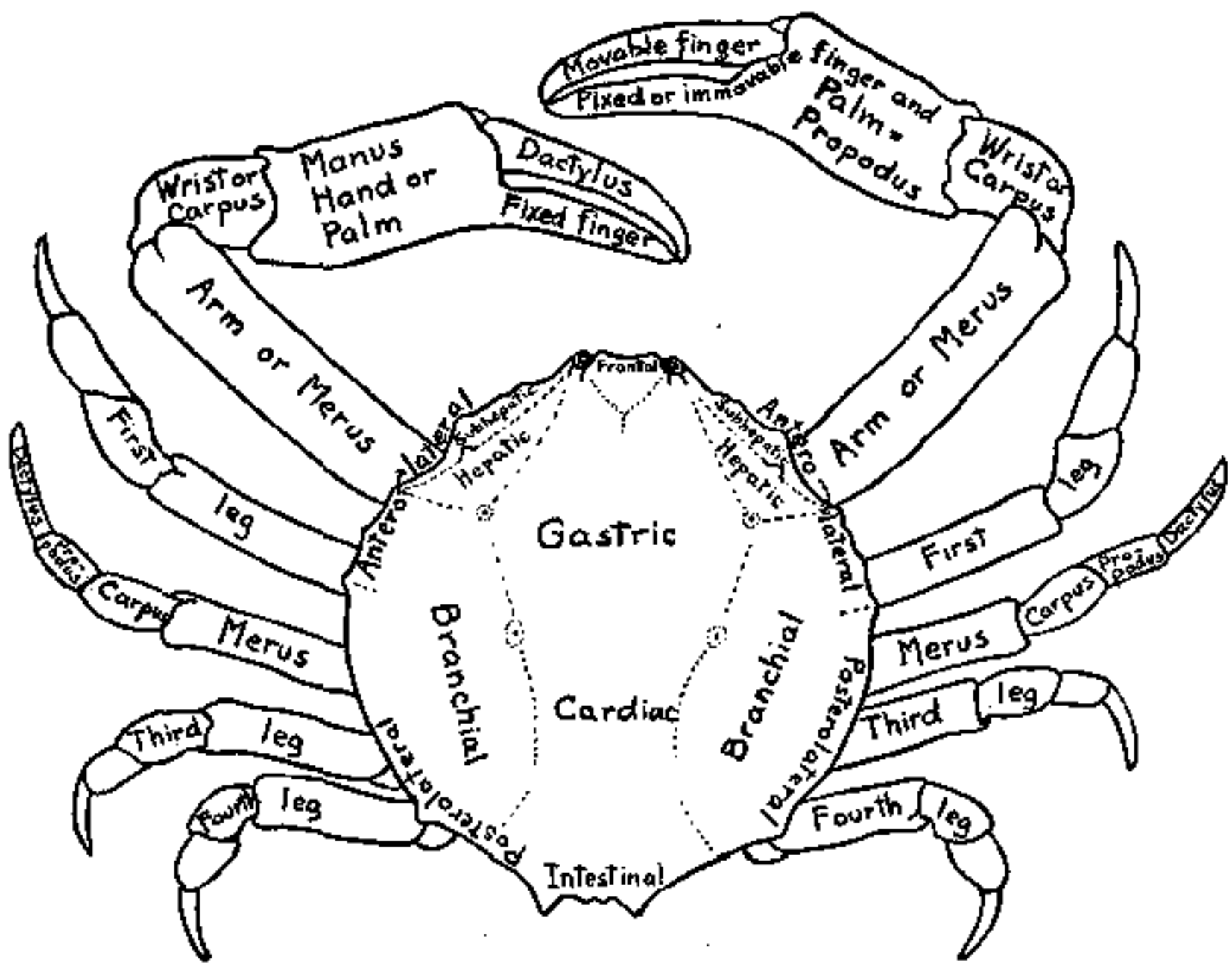


FIGURE 1.—Diagram of dorsal view of an oxystomatous crab, showing the terms used in description. By Waldo L. Schmitt.

described species. Dr. Horace G. Richards has continued his contributions to our collections, while Stewart Springer discovered a new giant *Calappa* in the Gulf of Mexico. The State University of Iowa has been very helpful in putting its collection of Decapoda at our disposal; it is now part of a loan deposit in the United States National Museum.

MEASUREMENTS AND ABBREVIATIONS USED

EXPLANATION OF MEASUREMENTS

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

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

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

The length of the articles of the chelipeds and legs is measured on the upper or anterior margin. The length of the whole cheliped or

leg is measured on the lower margin, from the articulation of the coxa with the sternum to the tip of the dactylus.

The width of articles 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.

See figures 1 and 2 for diagrams of an oxystomatous crab.

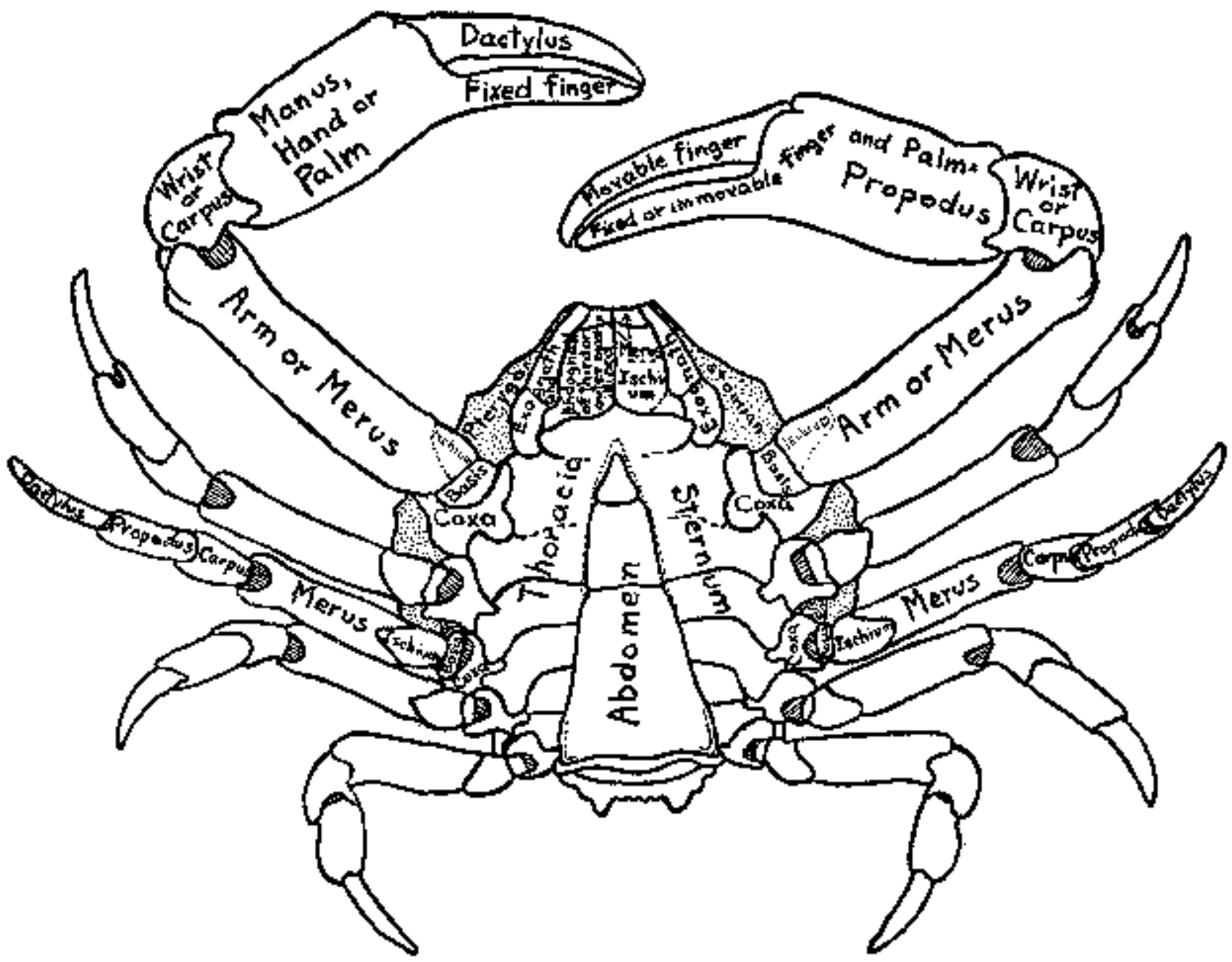


FIGURE 2.—Diagram of ventral view of an oxystomatous crab, showing the terms used in description. By Waldo L. Schmitt.

CHARACTER OF BOTTOM

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

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

ADDITIONAL ABBREVIATIONS AND NOTES

In the lists under "Material examined" and elsewhere, a number in parentheses following an indication of a specimen or specimens denotes a catalog number of the United States National Museum unless otherwise indicated. M. C. Z.=Museum of Comparative Zoology; P. M. Y. U.=Peabody Museum of Yale University; S. U. I.=Museum of the State University of Iowa; Mus. Paulista is at São Paulo, Brazil; the words "U. S. Fisheries Steamer" should be understood before *Albatross, Fish Hawk, Grampus,* and *Speedwell;* and "U. S. Coast Survey Steamer" before *Bache, Blake,* and *Hassler; Zaca*=Croker Expedition, California Academy of Sciences; *Anton Dohrn* in the Atlantic=Carnegie Institution; *Anton Dohrn* in the Pacific=Venice Marine Biological Station, University of California; y=young.

In the color notes made by Dr. Schmitt, the 1886 edition of Ridgway's "Nomenclature of Colors" is used.

THE OXYSTOMATOUS AND ALLIED CRABS OF AMERICA

Of the crabs treated in this volume, the Gymnopleura are the most unique and the most primitive, being derived from the Macrura.[2] The anterior thoracic sterna are broad, the posterior narrow and keel-like, carapace elongate in the shape of an urn, the last pair of legs reduced and dorsal in position. Represented in America by only four genera.

The Dromiacea include the "hairy crabs", which are typically subglobose, and others that are subquadrate, but all with a narrow front. The outer maxillipeds have the merus and ischium subquadrangular. The last one or two pairs of feet are small and subdorsal and hold in place a sponge, ascidian, or shell, which is used for concealment. The subtribe contains two superfamilies, in one of which the eyes are 2-jointed.

The Oxystomata are by far the largest group represented. They include the circular or ball-shaped crabs, the box or shame-faced crabs, and the smaller, usually flat and shield-shaped dorippids, or mask crabs, in which the legs of the last two pairs are short, slender, and elevated. In the oxystomes the mouth parts taper narrowly toward the front. The Calappidae, or shame-faced crabs, are distinguished by their large chelae, which when closed spread over the anterior part of the ventral surface.

The subtribe Hapalocarcinidea is represented on this continent by two genera and species, both of which live in coral galls. Its position in the Brachyura has not been definitely determined.

The single example of the subtribe Brachygnatha is inserted here because it was accidentally omitted from Bulletin 97, "The Grapsoid Crabs of America", *Geryon quinquedens*, p. 266.

[2] See Bourne, The Raninidae, Journ. Linn. Soc. London, Zool., vol. 35, p. 25, 1922.

ANALOGOUS SPECIES ON OPPOSITE SIDES OF THE CONTINENT

FAMILY RANINIDAE

Atlantic	Pacific
Raninoides loevis.	*Raninoides benedicti.*
Ranilia muricata.	*Ranilia angustata.*
Ranilia constricta.	*Ranilia fornicata.*

FAMILY DROMIIDAE

Dromidia antillensis.	*Dromidia larraburei.*
Hypoconcha arcuata.	*Hypoconcha panamensis.*

FAMILY DORIPPIDAE

Ethusa mascarone americana.	*Ethusa mascarone panamensis.*
Ethusa microphthalma.	*Ethusa lata.*
Ethusina abyssicola.	*Ethusina smithiana.*

FAMILY LEUCOSIIDAE

Ebalia cariosa.	*Ebalia magdalenensis.*
Uhlias limbatus.	*Uhlias ellipticus.*
Persephona punctata punctata.	*Persephona subovata.*
Iliacantha liodactylus	*Iliacantha hancocki.*
Iliacantha sparsa.	*Iliacantha schmitti.*

FAMILY CALAPPIDAE

Calappa flammea.	*Calappa convexa.*
Calappa angusta.	*Calappa saussurei.*
Hepatus princeps.	*Hepatus kossmanni.*
Osachila antillensis.	*Osachila galapagensis.*

SPECIES ON BOTH SIDES OF THE CONTINENT

FAMILY RANINIDAE

Raninoides loevis.
Symethis variolosa.

FAMILY DORIPPIDAE

Ethusa mascarone americana.

FAMILY CALAPPIDAE

Cycloës bairdii.

Order DECAPODA

Suborder REPTANTIA

Tribe BRACHYURA

KEY TO SUBTRIBES OF THE TRIBE BRACHYURA

A[1]. Anterior thoracic sterna very broad, posterior thoracic sterna narrow and keel-like. Posterior thoracic epimera largely exposed by reduction of the branchiostegite.... **GYMNOPLEURA** (p. 6)

A[2]. Anterior thoracic sterna not unusually broad, posterior thoracic sterna not keel-like. Posterior thoracic epimera covered by branchiostegite.

B[1]. Mouth field (endostome) prolonged forward to form a gutter. Last pair of legs normal or abnormal. Female openings generally sternal. First abdominal limbs lacking in female. Gills few..... **OXYSTOMATA** (p. 75)

B[2]. Mouth field roughly square.

C[1]. Buccal cavity covered by the external maxillipeds or nearly so.

D[1]. Last pair of legs abnormal, dorsal. Female openings coxal. First abdominal limbs of female present. Gills usually many..... **DROMIACEA** (p. 27)

D[2]. Last pair of legs normal, rarely reduced or dorsal. Female openings sternal. First abdominal limbs of female lacking. Gills few..... **BRACHYGNATHA** [1] (p. 264)

C[2]. Buccal cavity very wide, not covered by the narrow external maxillipeds..... **HAPALOCARCINIDEA** (p. 258)

Subtribe GYMNOPLEURA Bourne

Gymnopleura BOURNE, Journ. Linn. Soc. London, Zool., vol. 35, p. 55, 1922.

Anterior thoracic sterna broad, posterior thoracic sterna narrow and keel-like; posterior thoracic epimera largely exposed by reduction of branchiostegite; female openings on coxae; last pair of pereiopods dorsal in position, normal or reduced in size; sternal canal present; *thoracic nerve ganglion-chain elongate; antennary sternum triangular,* spout-shaped; branchiae eight on each side. (Bourne.)

Family RANINIDAE Dana

Raninidae DANA, United States Exploring Expedition, Crustacea, pt. 1, p. 390, 1852; pt. 2, p. 1428, 1853.—HENDERSON, Voyage of H. M. S. *Challenger*, Anomura, vol. 27, p. 27 (characters on p. 26), 1888.—ALCOCK, Journ. Asiatic Soc. Bengal, vol. 65, p. 288, 1896.—BOURNE, Journ. Linn. Soc. London, Zool., vol. 35, p. 56 *et seq.*, 1922.

[1] In this bulletin the genus *Geryon* only, family Goneplacidae.

Carapace remarkably elongate, but not covering the abdominal terga, the first four or five of which lie exposed in the dorsal plane of the body. The last pair of legs also is raised in the dorsal plane of the body. Antennae large; antennules also large, but they do not fold into fossettes. The vasa deferentia protrude through the bases of the fifth pair of legs; the oviducts pierce the basis of the third pair of legs. The sternum is broad anteriorly, very narrow or linear posteriorly. A pair of respiratory orifices between the tergum of the first abdominal segment and the coxae of the last pair of perciopods. The external maxillipeds completely cover the buccal cavern, and their palp is concealed in repose; their exopodite is but little longer than the ischium. The branchiae are less than nine in number on either side. (After Alcock.)

Manus very flat, terminating in a finger so bent that the movable finger is applied against the anterior border of the hand.

KEY TO THE AMERICAN GENERA OF THE FAMILY RANINIDAE

A¹. Fronto-orbital border more than half width of carapace.
  B¹. Orbits of moderate size, slightly oblique, situated on anterior border of carapace. Last pair of legs slender..... **Raninoides** (p. 7)
  B². Orbits very large, deep cavities in lower side of carapace, which form a V, with point at rostrum. Last pair of legs not unusually slender..... **Ranilia** (p. 17)
A². Fronto-orbital border less than half width of carapace.
  B¹. Carapace smooth. Chelae broad and flat..... **Lyreidus** (p. 21)
  B². Carapace croded. Chelae elongate, manus swollen, fingers long and slender..... **Symethis** (p. 24)

Genus RANINOIDES Milne Edwards

Raninoides MILNE EDWARDS, Histoire naturelle des Crustacés, vol. 2, p. 196, 1837 [type, *R. loevis* (Latreille)].—ALCOCK, Journ. Asiat. Soc. Bengal, vol. 65, p. 292, 1896.

Carapace elongate-obovate, strongly convex from side to side, often nearly twice as long as broad, its surface for the most part smooth, regions undefined. Fronto-orbital border slightly less than greatest width of carapace. Eyes typically small but distinct, eyestalks broadly dilated at base, orbits slightly oblique. Antennules about equal in size to antennae; antennae with a stout peduncle and slender flagellum, the peduncle not concealing the antennulary peduncle. Merus of external maxillipeds usually shorter than ischium, its edges slightly thickened and raised. Sternum broad between chelipeds and as far as the bases of the second pair of true legs, then becoming extremely narrow. Last pair of legs abnormally short and slender, arising much in advance of the penultimate pair. Abdomen of both sexes with seven separate segments. (After Alcock.)

Atlantic and Pacific coasts of America; Indian Ocean; East Indies.

KEY TO THE SPECIES OF THE GENUS RANINOIDES

A¹. Only one lateral spine on carapace. More than three frontal prominences.
  B¹. Two spines on carpus of cheliped.
    C¹. A spine at distal end of merus of cheliped. Four spines on lower margin of manus. A spine at base of mobile finger.
      D¹. Lateral tooth not reaching middle of length of outer frontal tooth ..... **loevis** (p. 8)
      D². Lateral tooth longer, reaching middle of length of outer frontal tooth ..... **benedicti** (p. 9)
    C². No spine at distal end of merus of cheliped.
      D¹. A spine at base of mobile finger. Five or six spines on lower margin of manus ..... **louisianensis** (p. 12)
      D². No spine at base of mobile finger. Three spines on lower margin of manus.
        E¹. Anterior end of carapace roughly granulate. A well-marked lateral tooth on rostrum ..... **ecuadorensis** (p. 15)
        E². Anterior end of carapace smooth to naked eye. Rostrum laterally angled, not toothed ..... **lamarcki** (p. 13)
  B². Only one spine, and that rudimentary, on carpus of cheliped. **fossor** (p. 16)
A². Two lateral spines on carapace. Only three frontal prominences ..... **nitidus** (p. 16)

ANALOGOUS SPECIES OF RANINOIDES ON OPPOSITE SIDES OF THE CONTINENT

Atlantic	Pacific
loevis.	*benedicti.*

RANINOIDES LOEVIS (Latreille)

FIGURE 3; PLATE 1, FIGURES 1, 2

Ranina dorsipes DESMAREST, Considerations générales sur la classe des Crustacés, p. 140, pl. 19, fig. 2, 1825; not *R. dorsipes* Lamarck, 1818.

Ranina loevis LATREILLE, Encyclopédie méthodique, Hist. Nat., vol. 10, p. 268, 1825 (type locality unknown; type in Paris Mus.).

Ranina levis MILNE EDWARDS, Histoire naturelle des Crustacés, vol. 2, p. 197, 1837.

Raninoides laevis A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 34, 1880.

Raninoides loevis RATHBUN, Univ. Iowa Studies Nat. Hist., vol. 9, no. 5, p. 66, 1921.

Raninoides laevis lamarcki BOONE, Bull. Vanderbilt Mar. Mus., vol. 2, p. 48 (part), pl. 9, fig. A, 1930; not *R. l.* var. *lamarcki* Milne Edwards and Bouvier, 1923.

Diagnosis.—A spine at distal end of merus of cheliped; two spines on carpus; four spines on inner margin of manus; one spine at base of mobile finger.

Description.—The four sinuses of the front appear longer than they are, owing to their continuance in a narrow gutter. The sinuses bordering the 3-toothed rostrum are not parallel but converge posteriorly. The tooth next to the rostrum is spine-tipped, the spine reaching to a line midway between the tip of the median tooth and the tip of the

submedian tooth. The succeeding sinus is longitudinal. Outer orbital tooth bifid, the inner branch very short, dentiform, the outer branch long, slender, and curved, tip directed inward but not quite reaching level of intermediate tooth. Hepatic spine slender, slightly curved. The spines of the cheliped are as follows: A small sharp spine near distal inner end of ischium; a curved spine at upper extremity of merus; two unequal spines placed obliquely-transversely on distal half of carpus, the outer spine much the larger; a similar spine near distal end of outer margin of manus and four irregular spines on inner margin; about 13 small spines on prehensile edge of immovable finger; a very small spine at proximal end of outer margin of dactyl. Distal end of dactyls of first and second ambulatories slender; inner edge of third dactyl very arcuate, outer edge distinctly hollowed.

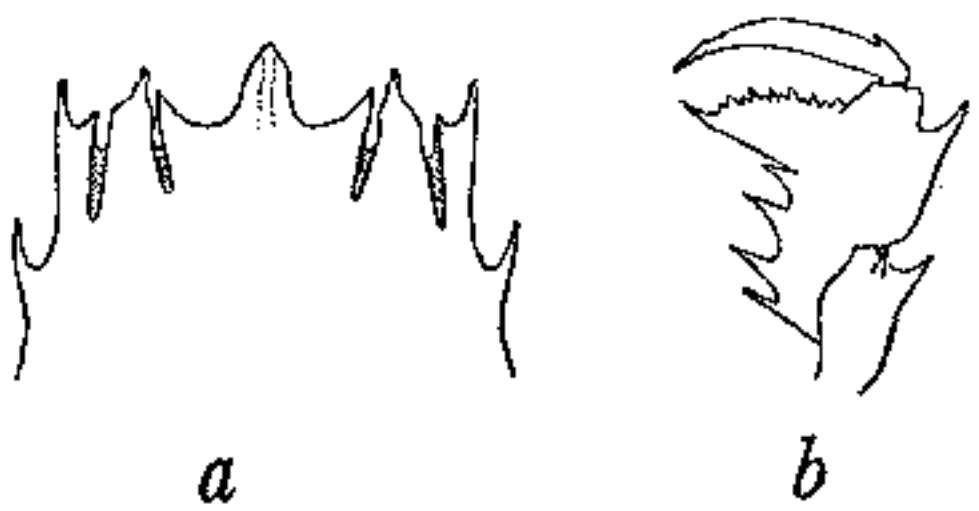


FIGURE 3.—*Raninoides loevis:* *a*, Anterior portion of carapace; *b*, distal half of right cheliped, upper surface.

Color (66749).—Grayish across middle, little yellowish brown anteriorly, all so faint that in life it is almost colorless; beneath with red flecks at base of antennae.

Measurements.—Male (22560), length of carapace 34, width at middle 19.6, width between tips of hepatic spines 19.3, width of front 12.6 mm.

Range.—West coast of Florida to north coast of South America and Barbados; Pacific coast of Panama and Colombia; 10 to 40 fathoms, 107 fathoms (Barbados).

Material examined.—See table 1, page 10.

RANINOIDES BENEDICTI Rathbun

FIGURES 4, 5; PLATE 1, FIGURES 7, 8

Raninoides laevis lamarcki BOONE, Bull. Vanderbilt Mar. Mus., vol. 2, p. 48 (part), pl. 9, figs. B, C 1930 (Pearl Islands, Panama); not *R. l.* var. *lamarcki* Milne Edwards and Bouvier, 1923.

Raninoides benedicti RATHBUN, Proc. Biol. Soc. Washington, vol. 48, p. 1, 1935 (type locality, off La Paz Bay, Mexico; type, U.S.N.M. no. 57685).

Diagnosis.—Lateral tooth longer than in *loevis*, reaching middle of length of outer frontal tooth. Palm long and narrow, movable finger exceeding immovable finger in length.

TABLE 1.—*Material examined of* Raninoides loevis

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
Atlantic											
FLORIDA:	° ′ ″	° ′ ″			°F.						
Sand Key (Florida Strait), W. 8½ mi.			31		74.5	Dec. 18, 1912	7787	*Fish Hawk*	1 ♂	66742	
Tortugas	S. of Southern Channel buoy.		40			July 22, 1924	39	W. L. Schmitt	1 ♀ y	66748	Gift of Carnegie Institution.
Do	S. of SW. Channel buoy.		37	sft. gy. Oz		Aug. 16, 1924	4	do	1 ♂ y	66750	Do.
Do	Between S. and SE. of SW. Channel buoy.		25	S. M		do	8	do	1 y	66746	Do.
Do	About 11 mi. S. of no. 2 red buoy.		37	shelly S		June 10, 1925	207	do	1 ♀ y	66745	Do.
Do	From black midchannel spar buoy to E. Channel red buoy.		10			June 11, 1925	211	do	1 ♂ y	66744	Do.
Do	S. of no. 2 red buoy		16	shelly S. For		do	214	do	1 ♀ y	66747	Do.
Do	do		30			do	220	do	1 ♂ y	66743	Do.
Do			35			July 13, 1930	8	do	1 ♂ y	66749	Do.
Off west coast of Florida	25 33 30	82 39 00	23	fne. S	67	Mar. 3, 1889	5081	*Grampus*	1 ♂	20217	
Do	25 34 00	82 50 00	25	lt. S. brk. Sh	67	Mar. 2, 1889	5080	do	1 ♀ 1 y	20216	
Do	25 44 32	82 48 15	24	brk. Sh. fne. S. Co	66.5	Mar. 11, 1889	5085	do	1 y	20219	
Do	25 54 00	82 29 00	16	gy. S. M	66.5	Mar. 16, 1889	5096	do	2 y	20221	
Do	25 54 00	83 20 00	31	gy. S. bk. Sp. brk. Sh.	69	Mar. 15, 1889	5092	do	1 y	20220	
Do	26 07 30	82 38 00	18	hrd. S	66	Mar. 17, 1889	5098	do	1 y	20222	
Do	26 08 00	83 22 00	33	S. bk. Sp	69.5	Mar. 18, 1889	5102	do	1 y	20223	
Do	26 17 30	83 00 00	24	fne. gy. S. bk. Sp	67	Mar. 21, 1889	5109	do	2 y	42227	
Do	26 25 33	82 43 00	23	sft. gy. M	66	Feb. 26, 1889	5069	do	1 y	20218	
W. of Charlotte Harbor	26 47 30	83 25 15	28	fne. wh. S. bk. Sp. brk. Sh.		Mar. 18, 1885	2410	*Albatross*	1 ♂	9822	
COLOMBIA: Santa Marta								C. F. Baker	1 ♀	22560	
LESSER ANTILLES: Barbados.	W. by N. of Pelican Island, 2¾ miles and drifting offshore.		107	fne. S		May 16, 1913	10	W. A. Crosby	2 ♂ 1 ♀	66741	
								State Univ. Iowa Barbados-Antigua Exped.	1 ♂ 1 y	Not extant	
Pacific											
PANAMA:											
Bahia Honda	Off S. point of bay		25–30	M. Sh		Feb. 22, 1934	248	*Velero III*	3 ♂ 4 ♀	69322	Hancock Galapagos Exped.
Jicarita Island	E. side		24	shelly, G		Feb. 20, 1934	240	do	1 ♀	69321	Do.
COLOMBIA: Cabita Bay, Cape Corrientes.	Dredging NW. of point.			M		Feb. 13, 1934	230	do	1 y	69415	Do.

Description.—Allied to *R. loevis*. Front similar; carina and lateral angle of median tooth less evident; inner angle of outer frontal tooth not spiniform. Propodus of cheliped elongate, two and one-half times as long as wide; proximal margin of fixed finger forming a

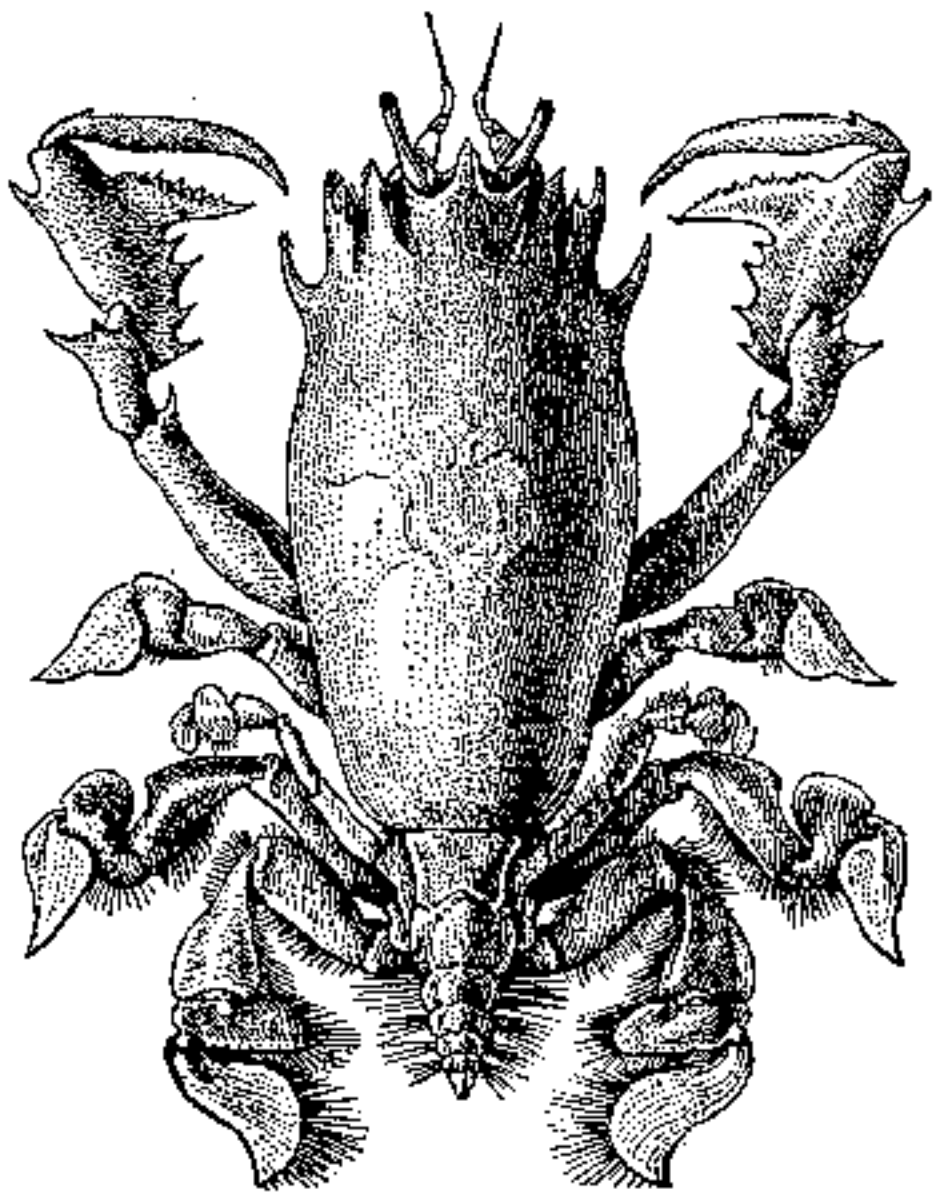


FIGURE 4.—*Raninoides benedicti:* Male holotype (57685), dorsal view, enlarged.

right angle with margin of palm; distal margin of same finger forming much more than a right angle with margin of palm; dactyl very long, considerably overreaching fixed finger, and with one, sometimes two, minute teeth near base of upper margin; tooth smaller than in

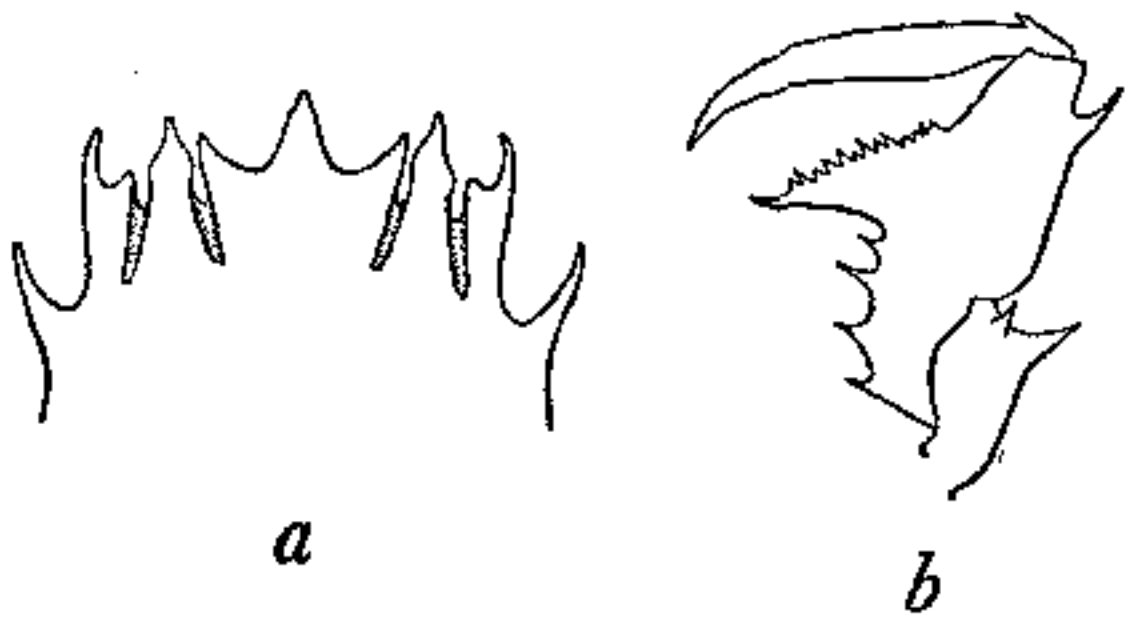


FIGURE 5.—*Raninoides benedicti:* *a*, Anterior portion of carapace; *b*, distal half of right cheliped, upper surface.

loevis. Dactyl of third ambulatory wider than in *loevis*, its posterior margin more arcuate.

Measurements.—Male holotype (57685), length of carapace 35.2, width at middle 16.3; width between tips of hepatic spines 19, width of front 12.8 mm.

Range.—Gulf of California, Mexico, to Ecuador; 2 to 26.5 fathoms.
Material examined.—See table 2, page 14.

RANINOIDES LOUISIANENSIS Rathbun

FIGURES 6, 7; PLATE 1, FIGURES 5, 6

Raninoides louisianensis RATHBUN, Proc. Biol. Soc. Washington, vol. 46, p. 186, 1933 (type locality, east of Mississippi Delta, 68 fathoms; cotypes, U.S.N.M. no. 9659).

Diagnosis.—No spine at distal end of merus of cheliped; five or six spines on lower margin of manus. A slender spine on ischium of second leg in male.

Description.—Differs from *R. loevis* as follows: All the sinuses of the front are longitudinal and shorter than in *loevis* and are continued

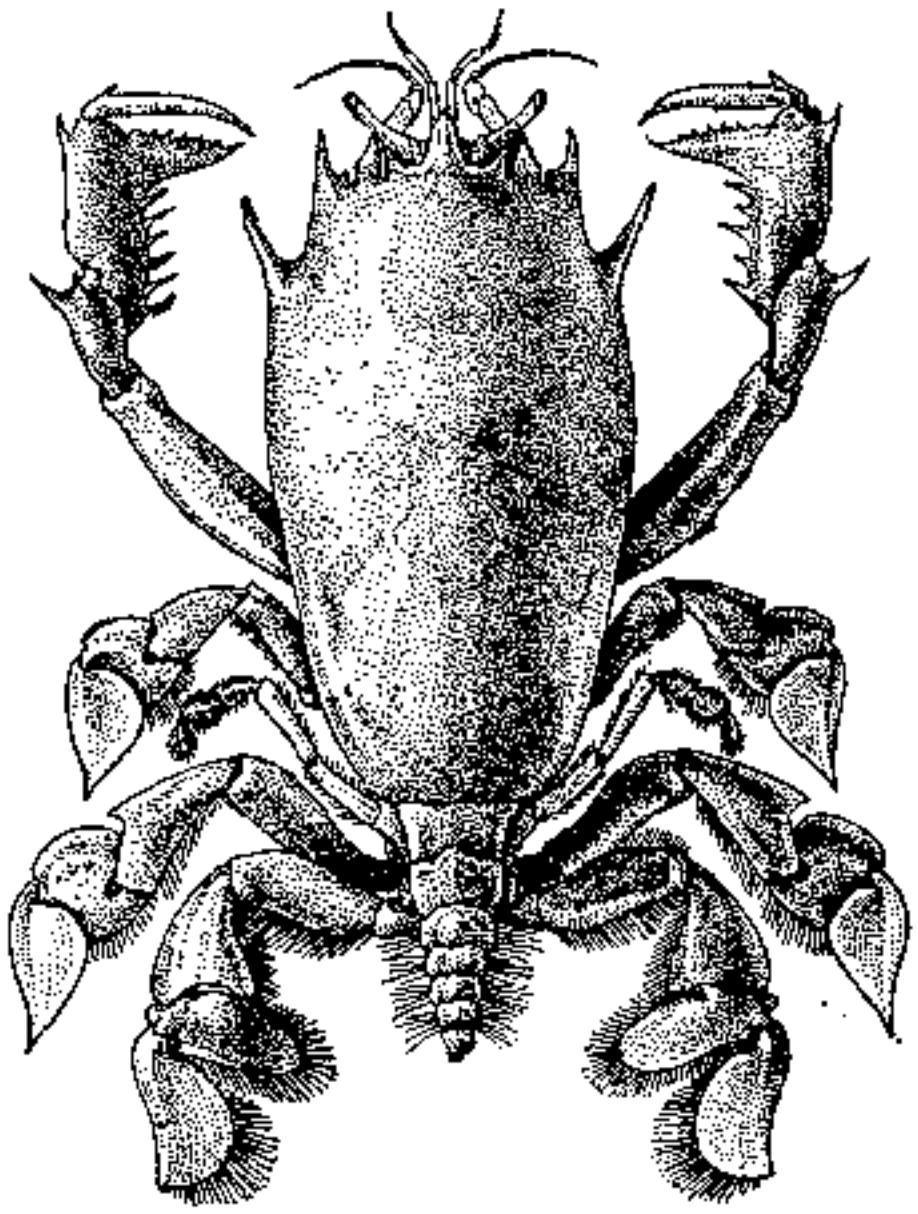


FIGURE 6.—*Raninoides louisianensis:* Male holotype (9659), dorsal view, enlarged.

backward by a very short gutter. Tooth next to the submedian tooth with a nearly straight inner margin, not distinctly angled; the slender outer orbital tooth is nearly straight. Hepatic tooth longer and straight instead of curved. No spine at extremity of merus of cheliped. Subterminal spine of manus nearer the end of the upper margin; lower margin with more numerous (five or six) and slenderer spines, with a few minute spinules interspersed. Dactyls of first and second ambulatories shorter and broader, of third leg larger and straighter on outer margin. A slender sharp spine near distal end of ischium of second leg of male.

Measurements.—Male type (9659), length of carapace 35.6, width at middle 18.4, width between tips of hepatic spines 20.8, width of front 12.2 mm.

Range.—Gulf of Mexico, 68 fathoms.

Material examined.—East of Mississippi Delta, La.; lat. 29°14′30″ N., long. 88°09′30″ W.; 68 fathoms, gy. M., February 11, 1885; station 2378, *Albatross*, 1 ♂, 2 ♀ (1 ovig.) (9659), 1 male on exhibition (20215).

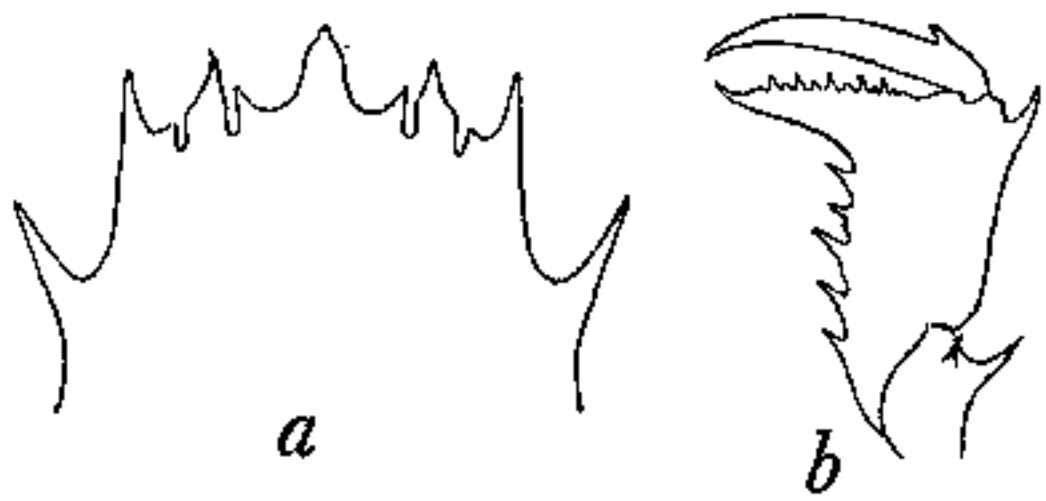


FIGURE 7.—*Raninoides louisianensis: a*, Anterior portion of carapace; *b*, distal half of right cheliped, upper surface.

RANINOIDES LAMARCKI Milne Edwards and Bouvier

FIGURE 8; PLATE 1, FIGURES 3, 4

?*Ranina dorsipes* LAMARCK,[4] Histoire naturelle des animaux sans vertèbres, vol. 5, p. 225, 1818.

Raninoides laevis var. *lamarcki* MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 47, p. 299, pl. 1, figs. 8, 9; pl. 2, figs. 4, 5, 1923 (type locality unknown; type in Paris Mus.).

Diagnosis.—Postorbital sinuses parallel and shorter than the distance separating them. Only three spines on lower margin of manus; no spine at base of mobile finger.

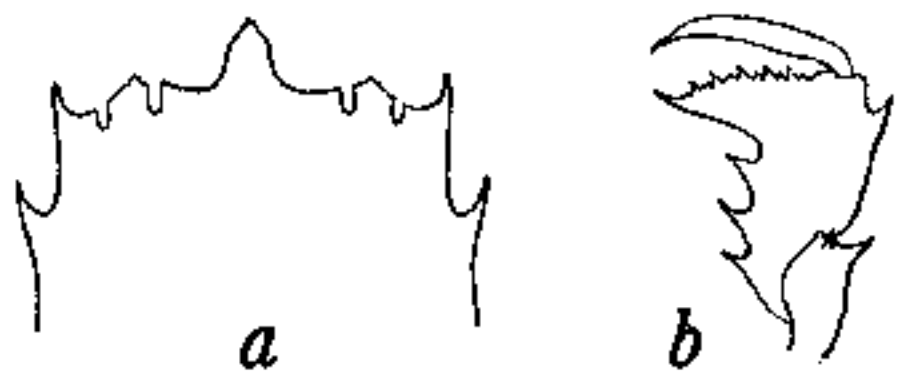


FIGURE 8.—*Raninoides lamarcki: a*, Anterior portion of carapace, enlarged (after Milne Edwards and Bouvier); *b*, distal half of right cheliped, upper surface.

Description.—Akin to *R. louisianensis*. The tooth on either side of the front, bounded by the sinuses, is devoid of a spine. The outer orbital spine and the hepatic spine are reduced. The arm lacks a spine. The dactyl of the third ambulatory is wider than in *louisianensis*.

[4] The *dorsipes* of Lamarck is said by him to inhabit the Indian and Southern Oceans. This would throw some doubt as to the identity of the specimen in the Paris Museum with that actually seen by Lamarck. The characters of the specimen figured by Bouvier in Mem. Mus. Comp. Zool., vol. 47, 1923, as *lamarcki* are those of the four American specimens that I here record as *R. lamarcki*.

TABLE 2.—*Material examined of* Raninoides benedicti

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″									
MEXICO: Off La Paz Bay	24 18 00	110 22 00	26.5	brk. Sh		Apr. 30, 1888	2823	*Albatross*	1♂	67685	Holotype.
COSTA RICA: Puerto Culebra.	In bay		10			Feb. 24, 1934	253	*Velero III*	1 ♀ 13 y	69203	Hancock Galapagos Exped.
ECUADOR:											
Cape San Francisco	Off river mouth		2	M. debris		Feb. 11, 1934	215	do	1 ♂ 2 y. 3 fragmentary.	69204	Do.
Do			20	Muck		do	216	do	3 ♂ 4 ♀ 12 y	69411	Do.

TABLE 3.—*Material examined of* Ranilia muricata

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″			° F.						
NORTH CAROLINA:											
Off Beaufort Harbor						May —, 1907		*Fish Hawk*	1 ♂	55182	
Do	34 17 00	76 56 00	16	Sh	79	Sept. 7, 1913	7951	do	1 ♀ ovig	51094	
FLORIDA:					° C.						
2¼ mi. NNE. of Fowey Rock Light.			36	fne. gy. S. brk. Sh	23.3	Mar. 30, 1903	7517	do	2 ♂	66751	
Straits of Florida	25 04 50	80 15 10	56	Co. S		Apr. 9, 1886	2639	*Albatross*	1 y	11535	
Garden Key, Tortugas								Whitehurst	1 ♀ softshell	M. C. Z.	
Fort Jefferson, Tortugas								Holder	1 ♀ ovig	M. C. Z.	
					° F.						
W. of Marco	26 29 00	82 57 00	21	gy. S	66	Mar. 22, 1889	5113	*Grampus*	1 ♀	21707	
West Florida						Apr. 24, 1872		*Bache*	1 ♀	M. C. Z.	Type of *Raninops stimpsoni*.
					° C.						
Anclote section	28 13 30	83 04 30	634	S. brk. Sh	13	Jan. 24, 1902	7244	*Fish Hawk*	1 ♂ 1 ♀	29001	
S. of Cape San Blas	29 11 30	85 29 00	26	S. G. brk. Sh	26	Feb. 7, 1885	2374	*Albatross*	1 carapace	9633	
Pensacola								Silas Stearns	1 ♀ ovig	4196	
									1 ♀ ovig	4613	
Do								do	2 ♂ 2 ♀	5231	From fish stomachs.
BAHAMA ISLANDS						1859		H. Bryant	1 ♂	65656	From Boston Soc. Nat. Hist.
Do								F. Stearns	1 ♂ 2 ♀ 1y	29002	
CARIBBEAN SEA: Swan Island						Apr. —, 1913		George Nelson	3y	M. C. Z.	

Measurements.—Type (from pl. 2, fig. 4, E. and B.), width between tips of hepatic spines 44.5, between tips of outer orbital spines 33 mm. Female young (7754), length of carapace 15.3, width between outer orbital angles 6.5, between tips of hepatic spines 8.4, and at middle of carapace 8.6 mm.

Range.—Greater Antilles to Panama.

Material examined.—Off Colon; lat. 9°27′ 00″ N., long. 79° 54′ 00″ W.; 25 fathoms; gn. M. brk. Sh.; April 2, 1884; station 2145, *Albatross*; 2 males, 1 female, all young (7754). North of Puerto Rico; lat. 18° 31′ 30″ N., long. 66° 14′ 55″ W.; 120 fathoms; March 8, 1933; station 105, Johnson-Smithsonian Expedition; 1 male (67813).

RANINOIDES ECUADORENSIS Rathbun

PLATE 80, FIGURES 5–7

Raninoides ecuadorensis RATHBUN, Proc. Biol. Soc. Washington, vol. 48, p. 1, 1935 (type locality, La Plata Island, Ecuador; type, U.S.N.M. no. 69319).

Diagnosis.—Anterior end of carapace roughly granulate. Three spines (rarely four) on lower margin of manus. No spine on merus.

Description.—Carapace widest at middle, tapering toward either end; finely and closely granulate across the front which is irregularly roughened. Anterolateral spine inclined slightly outward, the tip curving inward. Rostrum with two longitudinal furrows, a slender median tooth and a short lateral tooth directed forward. Outside the rostrum the adjacent angle is nearly a right angle, and is followed by a short tooth with convex sides and a short terminal point. Outer orbital tooth slender, curved, and reaching nearly as far forward as the tips of the lateral teeth of the rostrum. Merus of cheliped unarmed, carpus somewhat flattened above, each upper margin terminating distally in a minute tooth. Manus short, upper surface with two thin, parallel, erect rims, lower edge with three long slender spines (four in one of the largest specimens). No spine on movable finger; five on inner edge of fixed finger. The dactyls of the first three legs are crescentic, of the first leg short and broad and slightly hollowed out, of the second and third legs longer, narrower, and more crescentic, the second acutely pointed, the third bluntly tipped. The narrow fourth leg reaches only to middle of carpus of third leg; its dactyl is suboval.

Measurements.—Length of male 20.1, width 11.6 mm.

Type locality.—Ecuador: La Plata Island; 45–55 fathoms; sand, shale, rock; February 10, 1934; station 212, Hancock Galapagos Expedition; type specimen, male (69319); 50 specimens (69320).

RANINOIDES NITIDUS A. Milne Edwards

PLATE 2, FIGURES 1, 2

Raninoides nitidus A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 34, 1880 (type locality, off Grenada, B. W. I.; type not located).—A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 47, p. 298, pl. 2, fig. 1; pl. 3, fig. 1, 1923.

Diagnosis.—Front with three prominences, a triangular rostrum and a postocular spine on either side. Two spines behind the postorbital angle.

Description.—Rostrum elongate, postocular spine slender, slightly divergent, and nearly as long as the rostrum. One short orbital sinus. Lateral margins arcuate; the posterior of the spines corresponds to the lateral spine of *R. loevis*, but is situated much farther back, nearly to the widest point of the carapace; the anterior spine short, broad, and dentiform. Carapace glossy but with large punctae; cardiac region outlined. Ocular peduncles short, massive, one and one-half times as long as wide, not reaching end of rostrum or distal border of orbital spine; cornea large, ovoid, extending chiefly on the ventral side. Only one spine on wrist; manus unarmed above, three sharp teeth below near the fixed finger, the cutting edge of which has only two or three blunt prominences; mobile finger flat. Ambulatory legs as in *R. loevis*. Antennules and antennae unarmed; the flagellum of the latter is scarcely longer than the peduncle. Merus of outer maxillipeds a little longer than ischium; the following articles are much reduced.

Measurements.—Type male, length of carapace 8, width 4.5 mm.

Range.—Known only from the type specimen from off Grenada, B. W. I.; 159 fathoms; temperature 53.5° F.; 1878–79; *Blake* (whereabouts unknown).

RANINOIDES FOSSOR A. Milne Edwards [5]

PLATE 2, FIGURES 3–5

Raninopsis fossor A. MILNE EDWARDS, MS.

Raninoides fossor A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 47, p. 300, pl. 1, fig. 10; pl. 2, figs. 2, 3, 1923 (type locality unknown; *type in Paris Mus.*).

Diagnosis.—Distance between rostrum and next tooth greater than length of tooth. Spine of wrist rudimentary. Mobile finger ununarmed. Dactyls of ambulatory legs sickle-shaped.

Description.—Carapace wider than in other species; strongly granulous on frontal region as far back as a transverse line a little in advance of lateral spine. Sinuses of fronto-orbital border more reduced than in *R. lamarcki*. Rostrum composed of a slender median spine and two short subrectangular teeth a little produced at their

[5] It is not certain that this species belongs to the American fauna, but I follow A. Milne Edwards and Bouvier in grouping it here.

outer angles. The quadrangular space between either one of these teeth and the next tooth is about subequal or very slightly greater than the length of this latter tooth; between this latter tooth and the slender postocular spine that follows it a triangular sinus intervenes. The postocular spine is strongly curved and inclinded inward. Postorbital spine similar. Ocular peduncles short and wide, similar to those of *R. nitidus*. Wrist with a rudimentary spine; manus with a slender spine above and three below; prehensile edge of immobile finger armed with five small spines; dactyls of ambulatory legs sickle-shaped.

Measurements (after figure by Milne Edwards and Bouvier).—Width of carapace just behind lateral spines 13⅓, width of front 7⅓ mm.

Range.—Unknown.[5]

Genus RANILIA Milne Edwards

Ranilia Milne Edwards, Histoire naturelle des Crustacés, vol. 2, p. 195, 1837 (type, *R. muricata* Milne Edwards).

Notopus De Haan, Fauna Japonica, p. 138, 1841 (type, *N. rumphii* Rathbun, 1897=*N. dorsipes* De Haan, 1841, not *Cancer dorsipes* Linnaeus, 1758).

Raninops A. Milne Edwards, Bull. Mus. Comp. Zool., vol. 8, p. 34, 1880 (type, *R. constrictus* A. Milne Edwards, 1880).

Carapace broad oval. Orbits directed very obliquely downward from the rostrum, together forming an inverted V, and invisible from above; eyes stout. Antennae directed forward, basal article a little dilated inward. Third article of outer maxillipeds longer than second. The sternal plastron becomes linear between the first pair of ambulatory legs, but between the second and third pairs it enlarges again in a slightly concave, hexagonal disk. Last pair of legs not remarkably reduced.

East and west Atlantic and east and west Pacific Oceans.

ANALOGOUS SPECIES OF RANILIA ON OPPOSITE SIDES OF THE CONTINENT

Atlantic	Pacific
muricata.	*angustata.*
constricta.	*fornicata.*

KEY TO THE AMERICAN SPECIES OF THE GENUS RANILIA

A[1]. Manus with a spine on upper margin.
  B[1]. Carapace about 1.4 times as long as wide. Dactyl of third ambulatory broad, its upper margin nearly straight _ **muricata** (p. 18)
  B[2]. Carapace narrower, smoother, and more glabrous_____ **angustata** (p. 19)
A[2]. Manus without spine on upper margin.
  B[1]. Dactyl of third ambulatory crescentic_____ **constricta** (p. 20)
  B[2]. Dactyl of third ambulatory with convex lower border, upper nearly straight_____ **fornicata** (p. 20)

[5] It is not certain that this species belongs to the American fauna, but I follow A. Milne Edwards and Bouvier in grouping it here.

RANILIA MURICATA Milne Edwards

PLATE 3, FIGURES 3–6; PLATE 4, FIGURES 1–4

Ranilia muricata MILNE EDWARDS, Histoire naturelle des Crustacés, vol. 2, p. 196, 1837 (type locality unknown; type in Paris Mus.).—GIBBES, Proc. 3d Meet. Amer. Assoc. Adv. Sci., p. 23, 1850 (Florida); Proc. Elliot Soc., Charleston, S. C., vol. 1, p. 225, pl. 13, 1857 (North Carolina to Florida).—KINGSLEY, Proc. Acad. Nat. Sci. Philadelphia, 1878, p. 325.—HAY and SHORE, Bull. U. S. Bur. Fish., vol. 35 (1915–16), p. 420, pl. 31, fig. 1, 1918.

Raninops stimpsoni A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 35, 1880 (type locality, reefs of western Florida; type in Mus. Comp. Zool.).

Ranilia stimpsoni A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 47, p. 303, pl. 1, fig. 14; pl. 2, fig. 6; pl. 3, fig. 6–9, 1923. (The captions of figs. 8 and 9, pl. 3, should be transposed.)

Diagnosis.—Manus with a spine above. Dactyl of cheliped rough above at proximal end. Dactyl of third ambulatory broad, its upper margin nearly straight.

Description.—Carapace oval, strongly convex from side to side, slightly so from front to back, smooth posteriorly but anteriorly with numerous short, transverse, arcuate lines, denticulate and ciliate; rostrum slender; anterior border of carapace with four strong spines on each side; the third surmounts the external angle of these cavities, and the fourth is at the external angle of the front. Eyestalks strong, capable of being turned back into the deep, oblique orbits. Antennules very small; antennae directed forward and slightly longer than the eystalks. Chelipeds stout, flattened distally, squamose-denticulate above and with a strong spine on the supero-distal margin of carpus and manus and the inner distal margin of merus; distal margin of manus perpendicular, toothed; dactyl strong, curved, three crenulated ridges above on the basal portion. First three pairs of ambulatory legs with flattened, triangular dactyls; fourth pair elevated and densely fringed with hairs. Abdomen short and narrow.

Color.—Porcelain white with red vermiculate transverse lines on the carapace and red dots and blotches on the legs. (See figure by Hay.) Color prevailing in the dry specimen is purplish, mixed with yellow and orange in places, particularly about the articulations and spines; the latter are generally purple at the base, orange in the middle, and white at the tip; and the movable finger of the first pair of feet is colored much in the same manner; the upper surface of the first pair of feet is purple, purple tracings ornament the outer surface of the remaining pairs of feet, particularly the fourth and fifth, and the outer surface of the abdominal segments is marked with two longitudinal lines of purple. (Gibbes.)

Habits.—"This species * * * appears to be confined to the sand bottoms well off shore. In the operations on the Blackfish Banks in 1913 and 1914 several specimens were obtained in the dredge

and fragments of others were secured from fish stomachs. It has not been met within the harbor nor along the beaches." (Hay.)

Measurements.—Carapace (9632), length 39.4, width of middle 28.3, width at outer spines 26.7 mm. The largest specimen, female (5231), from a fish stomach, measures about 41 mm long.

Range.—North Carolina to Gulf of Mexico and Caribbean Sea; to 56 fathoms.

Material examined.—See table 3, page 14.

RANILIA ANGUSTATA Stimpson

FIGURE 9; PLATE 3, FIGURES 1, 2

Ranilia angustata STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 7, p. 240 [112], 1860 (type locality, Cape St. Lucas; type not extant).

Description.—"Very closely allied to *R. muricata*, but with the carapax conspicuously narrower, smoother, and more glabrous."

FIGURE 9.—*Ranilia angustata*, male: *a*, Anterior portion of carapace; *b*, distal half of right cheliped, upper surface. ×3.

Color.—"Carapax pale red in alcoholic specimens, closely maculated with white, the spots being generally about one-fifteenth of an inch in diameter, but sometimes larger, and so much crowded, that the carapax appears white, reticulated with red."

Measurements.—"Length of carapax in a male, 0.93; breadth, 0.66 inch" [23.6 mm long, 16.8 mm broad]. (Stimpson.)

The margins of the middle half of the carapace are nearly parallel and are straighter than in *muricata*. Spines of carapace slenderer in *angustata;* rostral spine longer relatively than in *muricata*, extending noticeably beyond the adjacent pair of spines. Of the four anterolateral spines in *angustata*, the distance between third and fourth is less than between third and first, while in *muricata* the reverse is true. The short granulated lines which cover the greater part of carapace in *muricata* are present in *angustata* only on the anterior, arcuate portion of carapace; the rest of the surface is smooth and covered with separated punctae. The spine on upper margin of palm is less erect and more curved in *angustata*.

Range.—West coast of Mexico.

Material examined.—Tiburon Island, south end; 10 fathoms; January 1, 1932; S. A. Glassell; 1 female. La Paz, Gulf of California; 1882; L. Belding; 1 female (5232).

RANILIA CONSTRICTA (A. Milne Edwards)

PLATE 4, FIGURE 5; PLATE 5, FIGURES 1, 2

Raninops constrictus A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 35, 1880 (type locality, near Sombrero, 47 fathoms; whereabouts of type unknown).

Ranilia constricta A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 47, p. 302, pl. 1, fig. 11–13; pl. 3, fig. 2–5, 1923.

Diagnosis.—Manus without spine above. Dactyl of cheliped smooth. Dactyl of third ambulatory crescentic.

Description.—Carapace much constricted laterally in the form of a roof, especially in the anterior half. Surface punctate and with short denticulate lines a little behind the orbital margin. The narrow rostral spine extends definitely beyond the line of the adjacent teeth; *frontal sinuses shallow, the supra-orbital border appearing straighter* than in *muricata;* the orbit is longer than in *muricata*, and the lateral spine is nearer the orbit. Manus unarmed above; carpus and merus armed as in *muricata;* three or four wide subobtuse teeth on fixed finger; dactyl smooth. Dactyl of third ambulatory crescent-shaped, of fourth similar to that of first leg.

Measurements.—Female (48642), length of carapace 22.8, width at middle 15.7, width between tips of outer spines 15.5 mm.

Range.—Florida Straits [6]; Cuba.

Material examined.—Cuba: Bahia Honda; caught with handline on reef; June 17, 1914; from Henderson and Bartsch, *Tomas Barrera* Expedition; 1 female (48642).

RANILIA FORNICATA (Faxon)

PLATE 5, FIGURES 3, 4

Raninops fornicata FAXON, Bull. Mus. Comp. Zool., vol. 24, p. 162, 1893 (type locality, station 3369, *Albatross;* type in M. C. Z.); Mem. Mus. Comp. Zool., vol. 18, p. 41, pl. 7, figs. 1, 1a, 1b, 1895.

Ranilia fornicata A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 47, p. 302, 1923.

Diagnosis.—Front part of carapace conspicuously narrow and much produced beyond the anterolateral angles; rostrum definitely longer than adjacent spines. *Merus and carpus of cheliped with a superior* terminal spine and propodus without. Dactyl of third leg with very convex inner border.

Description.—Carapace very convex from side to side, naked, smooth or nearly so, punctate. Rostrum acute, lightly carinate,

[6] Prof. Bouvier in listing the species of *Ranilia* (*op. cit.*, 1923, p. 301) gives "Antilles, 47 brasses" for the type locality of *constricta*, which is (p. 303) "au large de Sombrero." The collector of the type specimen, Dr. William Stimpson, spent several seasons on the Florida reefs including Sombrero and, so far as can be ascertained, made no excursions to the island of Sombrero, east of the Virgin Islands.

the carina extending backward for a short distance on the carapace. Superior margin of orbit armed with three acute teeth, the second of which is curved forward; the anterior tooth is separated from the rostrum by a deep rounded sinus, from the second tooth by an angular notch; the second tooth is separated from the third by a nearly straight interval; the third tooth lies some distance in front of the posterior end of the orbit. Back of the orbit there is a long and strong procurved spine on the margin of the carapace. Eyestalks compressed, equal in length to one half the width of the carapace. Second segment of the third maxilliped equal to the third joint, and crossed by a piliferous line; third segment notched at the antero-internal angle. Cheliped: Merus microscopically spinose above, setose below, and with an inner distal spine, tip sometimes broken off; carpus minutely rugoso-spinulose, the superior distal angle projecting as a sharp tooth; propodus lightly rugose, upper and lower borders margined, unarmed, palmar edge irregularly and inconspicuously toothed; dactylus without any prominent tooth. The dactylus of the third pair of legs has a very convex internal border, the dactylus of the fourth is long, narrow, and spatulate. Abdomen setose; telson obtuse at the end. (Faxon.)

Measurements.—Type specimen, length of carapace 12, breadth 8.6 mm.

Range.—From Cape St. Lucas to Ecuador; 7 to 70 fathoms.

Material examined.—See table 4, p. 22.

Genus LYREIDUS De Haan

Lyreidus De Haan, Fauna Japonica, Crustacea, p. 138, 1841 (type, *L. tridentatus* De Haan).—Alcock, Journ. Asiat. Soc. Bengal, vol. 65, p. 294 [299], 1896.

Carapace elongate-obovate, the anterolateral margins independent and gradually convergent; strongly convex from side to side and slightly convex from before backward; smooth and polished, regions undefined. Fronto-orbital border less than half the breadth of carapace. Eyes small; eyestalks short, broad at base, orbits hardly oblique. Antennules about equal in size to antennae; antennae with a stoutish peduncle and rather short slender flagellum, the peduncle not concealing the antennulary peduncle. Merus of external maxillipeds a little longer than ischium. Sternum broad as far as the bases of the first pair of true legs, then becoming narrow. Last pair of legs abnormally short and slender arising well in advance of the posterior pair. The abdomen in both sexes consists of seven distinct segments. (Alcock.)

West Atlantic, Indian, and west Pacific Oceans.

TABLE 4.—*Material examined of* Ranilia fornicata

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
MEXICO:	° ′ ″	° ′ ″			°F.						
Magdalena Bay			15			Dec. 3, 1931		S. A. Glassell	1 ♂	Glassell coll.	
Off Cape St. Lucas	22 52 00	109 55 00	31	rky		May 1, 1888	2829	*Albatross*	1 ♂	21709	
Carmen Island, Salinas Bay, Lower California.			10			Dec. 19, 1931		S. A. Glassell	1 ♀	Glassell coll.	
Off Clarion Island	18 18 30	114 44 30	54	brk. Co.	66.6	Mar. 6, 1889	2994	*Albatross*	2y	21710	
PANAMA:											
Bay of Panama	7 37 00	78 46 30	62	gy. S. bk. Sp. brk. Sh	59.6	Mar. 5, 1888	2794	do	1y	21708	
Off Panama	5 32 45	86 55 20	52	rky	62.2	Feb. 28, 1891	3369	do	1 ♀ type.	4506, M. C. Z.	
Jicarita Island	E. side		24	shelly, G		Feb. 20, 1934	240	*Velero III*	1 ♂ 1 ♀	69269	Hancock Galapagos Exped.
COLOMBIA:											
Gorgona Island	N. end of isle		20			Feb. 12, 1934	221	do	1 ♀	69268	Do.
Do			Dredged.			do	223	do	1 ♂	69622	Do.
ECUADOR:	*Latitude S.*										
La Plata Island			7–10	rky		Feb. 10, 1934	213	do	1 ♂	69199	Do.
Do			45–55	S. R. Shale		do	212	do	2 ♂	69270	Do.
Galapagos Islands	0 0 55	90 30 00	58–60			Jan. 26, 1934	190	do	2 ♀	69201	Do.
Do	0 0 55	90 30 00	70	S		do	191	do	5 ♀	69200	Do.
Do	Tagus Cove, Albemarle Island, S. of Cove		30			Jan. 13, 1934	147	do	1 ♂	69198	Do.
Do	James Bay, James Island		50–70			Jan. 24, 1934	183	do	1 ♂	69341	Do.

LYREIDUS BAIRDII Smith

PLATE 5, FIGURES 5, 6

Lyreidus bairdii S. I. SMITH, Proc. U. S. Nat. Mus., vol. 3, p. 420, 1881 (type locality, off Marthas Vineyard, Mass., 100 fathoms, station 873, *Fish Hawk*; type, U. S. N. M. no. 21363).

Diagnosis.—Median frontal tooth longer than lateral. Anterolateral spines small. No spine on outer surface of arm or wrist; a spine on upper edge of palm.

Description.—Carapace about one and three-fourths times as long as breadth at anterolateral angles, back of which it narrows only slightly for half the length of the lateral margins, which then curve regularly around to the articulation with the abdomen. The rostrum or median tooth of the deeply tridentate front is acutely triangular and longer than broad; lateral teeth narrower and a little shorter. The orbital sinuses are nearly as deep as broad and broadly rounded behind. Edge of anterolateral margin rounded but armed with a spinule about one-third the way from the lateral to the anterior angle, and in front of this spinule the carapace is suddenly narrowed so that the margin in front of the spinule is concave in outline as seen from above. Posterior half of lateral margin marked by a distinct carina, but the anterior half is smoothly rounded. The eyestalks are narrowed to triangular tips, which scarcely reach the tips of the lateral teeth of the front; eyes black, on outer and inferior edge of stalks.

Chelipeds nearly as long as carapace; carpus with a spine and some granules on upper margin; propodus short and much compressed; distal margin transverse and nearly as long as the length of the article; dorsal edge thin and sharp, terminating in a sharp tooth near the articulation of the dactylus; back of the thin digital process the inferior edge is armed with three to six teeth, decreasing in size proximally. Dactylus compressed and very thin, the outer edge regularly curved and sharp; prehensile edge sharp and slightly irregular in outline, but not dentate, although the opposing edge of the propodus is armed with about five or six low teeth inside the "thumb". Dactyls of first and second ambulatories long, narrow and thin edged; carpus and propodus broader in first than in second. In the third pair the propodus is nearly twice as broad as long, the inferior edge expanded into a thin, broad, lamellar process nearly as large as the body of the article, and with a ciliated and regularly curved margin nearly semicircular in outline. Dactylus nearly as broad as propodus, lamellar throughout, articulated at the upper end of proximal margin, which, below the articulation, is concave in outline and ciliated to match the adjoining lamellar process of the propodus; lateral margins naked and convex in outline, except near tip, which is sharply acuminate.

Abdomen slightly more than two-thirds as long as carapace; it is bent at fourth somite, which is armed with a small, conical spine projecting from the middle of the dorsal surface. Subhepatic and adjacent pleural regions slightly hairy or pubescent and finely granulate. (After Smith.)

Color.—Carapace all over above light orange-rufous, darker toward rostral spines, which are white on margins and tips. Edge of carapace all around white as are margins and tips of lateral spines. Legs paler than carapace. The last legs and paddles pinkish vinaceous (looking as if a dash of lavender had been added), as are chelipeds and fingers; a tinge of orange-rufous at articulation near insertion of movable finger on palm; under parts a sort of bluish or grayish china white. Dactyls of all legs more like lilac than pinkish vinaceous. (W. L. Schmitt.)

Measurements.—Type female, length of carapace 38.4, breadth just back of lateral spines 22, between tips of lateral spines 22.5, breadth of front between tips of spines 6.8, length of rostrum 4, of abdomen 25 mm. (Smith.)

Range.—Off Marthas Vineyard, Mass., to Gulf of Mexico and the Greater Antilles; 65 to 260 fathoms.

Material examined.—See table 5, page 25.

Genus SYMETHIS Weber

Symethis WEBER, Nomenclator entomologicus, p. 92, 1795 [type, *S. variolosa* (Fabricius)].

Zanclifer HENDERSON, Voyage of H. M. S. *Challenger*, vol. 27, p. 34, 1888 [type, *Z. caribensis* (de Freminville)].

Carapace ovate, convex from side to side and from before backward, its surface partly uneven. Fronto-orbital border very narrow, considerably less than half the width of carapace, frontal region trilobate produced anteriorly. Eyes rudimentary, placed in ill-defined orbits; the peduncles short, and the corneae of small size though pigmented. Antennal peduncle massive, first segment fused with carapace, second with a very prominent external prolongation; flagellum short. Antennules small, completely concealed by the antennal peduncles, which meet in the middle line. Outer maxillipeds moderately broad, ischium twice the length of the merus. Sternal thoracic shield narrow, becoming linear between ambulatory legs of first pair, but slightly dilating again between first and second pairs. Chelipeds of considerable length, propodus swollen laterally, fingers long. Ambulatories with uncinate dactyli, last pair of small size but not filiform. Male generative appendages similar to but shorter than those of *Raninoides*. (Henderson.) East and west coasts of Middle America.

TABLE 5.—*Material examined of* Lyreidus bairdii

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″			°F.						
MASSACHUSETTS:											
S. of Marthas Vineyard	40 02 00	70 57 00	100	sft. stky. M.	51	Sept. 13, 1880	873	*Fish Hawk*	1 ♀	21363	Holotype.
Do	39 57 00	70 56 00	120	sft. stky. M.	53	do	876	do	1	P. M. Y. C.	
FLORIDA:											
Tortugas	About 15 mi. S. of no. 2 red buoy.		100			July 15, 1930	14	W. L. Schmitt	7 ♂ 6 ♀	66634	Gift of Carnegie Institution.
Do	About 13 mi. S. of no. 2 red buoy.		100	sft. M.		July 29, 1930	35	do	1 ♂ 1 ♀ ovig.	66637	Do.
Do	About 18 mi. S. of no. 2 red buoy.		153–158			July 22, 1931	32	do	1 ♂ 1 ♀	66633	Do.
Do	About 16 mi. S. of no. 2 red buoy.		65			June 30, 1932	25	do	4 ♂ 3 ♀	66638	Do.
Do	About 13 mi. S. of no. 2 red buoy.		140–79			July 2, 1932	29	do	1 ♂ 1 ♀	66632	Do.
Do	About 15 mi. S. of no. 2 red buoy.		98			July 16, 1932	49	do	1 ♂	66635	Do.
Do			168			do	55	do	2 ♂ 3 ♀ (1 ovig.)		Do.
Do	About 14 mi. S. of no. 2 red buoy.		92–94			July 23, 1932	57	do	3 ♂	66639	Do.
Do	About 16 mi. S. of no. 2 red buoy.		130–112	M.		Aug. 5, 1932	72	do	6 ♂ 1 ♀ ovig.	66636	Do.
SW. of Cape San Blas	28 36 00	85 33 30	111	gy. M.		Mar. 14, 1885	2402	*Albatross*	1 y.	9763	
LOUISIANA: E. of Mississippi Delta.	29 07 30	88 08 00	210	gy. M.	67	Feb. 11, 1885	2377	do	2 ♂ 2 ♀	9660	
PUERTO RICO: N. of	18 32 00	66 21 15	260				23	Johnson-Smithsonian Exped.	2 ♂	67814	

SYMETHIS VARIOLOSA (Fabricius)

FIGURE 10; PLATE 5, FIGURES 7, 8

Hippa variolosa FABRICIUS, *Entomologia systematica emendata et aucta*, vol. 2, p. 476, 1793 (type locality, "in Oceano Indico"; type in Kiel Mus.).

Symethis variolosa WEBER, *Nomenclator entomologicus*, p. 92, 1795.

Eryon trilobatus DE FREMINVILLE, Icones crustaceorum quae ad littora America meridionalis reperiunter à C. P. de Freminville (MS.).

Eryon caribensis DE FREMINVILLE, Ann. Sci. Nat., ser. 1, vol. 25, p. 275, pl. 8B, figs. 1, 2, 1832 (type locality, Bay of Fort Royal, Martinique; type not extant).—MILNE EDWARDS, Histoire naturelle des Crustacés, vol. 2, p. 198, 1837.

Zanclifer caribensis HENDERSON, Voyage of H. M. S. *Challenger*, Anomura, vol. 27, p. 34, pl. 3, fig. 2, 1888.

Diagnosis.—Anterior half of carapace eroded; front narrow. Chelae elongate. Dactyli of ambulatories sickle-shaped.

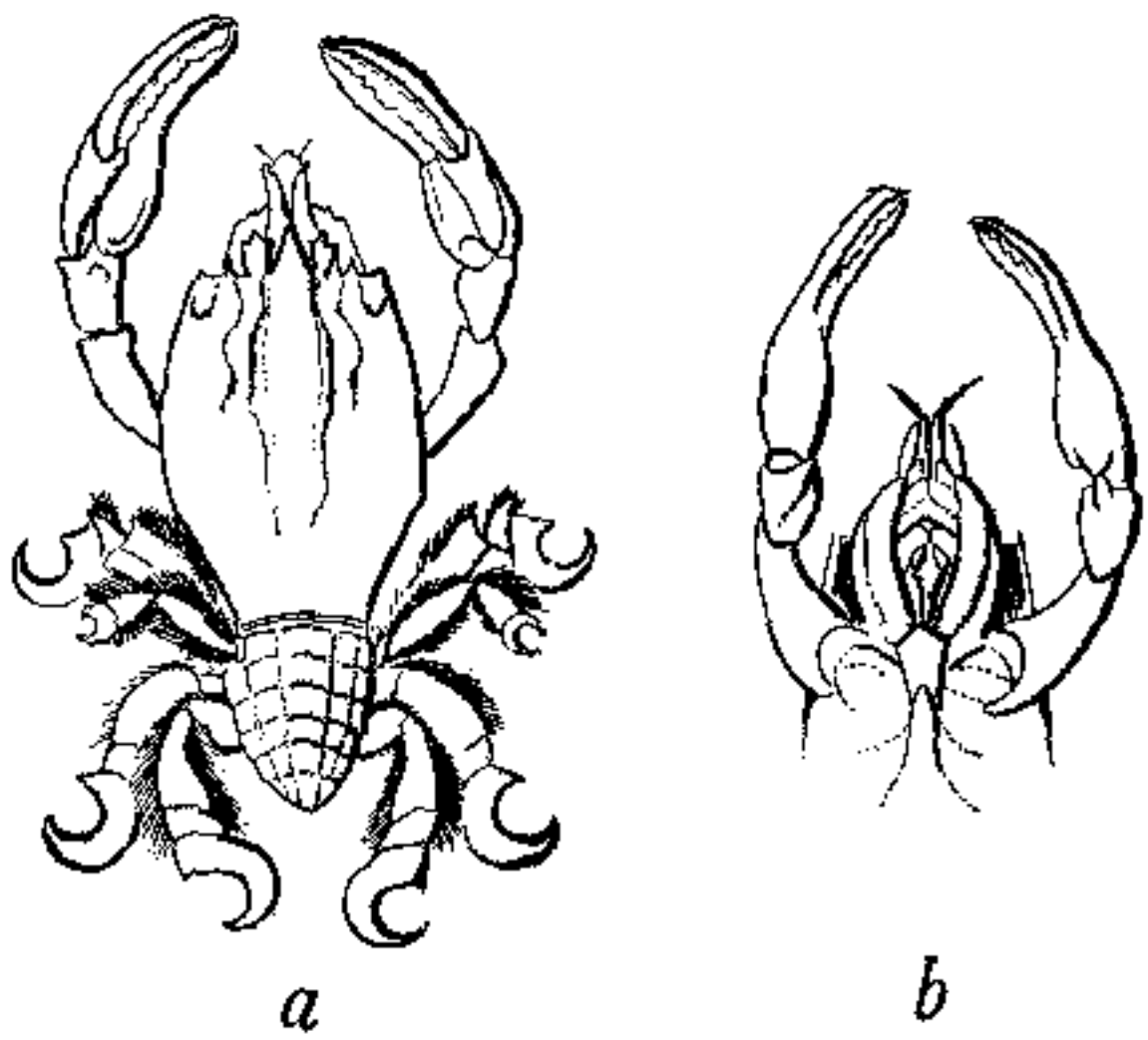


FIGURE 10.—*Symethis variolosa*, after de Freminville: *a*, Dorsal view, natural size; *b*, anterior half, ventral view.

Description.—Surface everywhere finely granulated. Carapace one and one-half times as long as wide; anterior half with numerous eroded depressions arranged symmetrically on both sides; immediately behind the frontal region the carapace rises abruptly, and the edge of the ridge thus formed is drawn out into three processes, which are separated from one another by eroded depressions; the floor in all the depressions is more coarsely granular than the rest of the carapace. Frontal region considerably produced, terminating in three small rounded lobes, the median largest. A rounded tooth at outer side of orbit is separated by a concave depression from the anterolateral tooth. Posterolateral margin a raised, sinuous, granular line. Merus of outer maxilliped with a longitudinal sulcus on outer surface; palpus abortive. Pterygostomial region moderately convex and separated from the carapace proper by a deep groove, which becomes continuous with the line on the posterolateral border. The fingers exceed the

palm in length and are furnished with numerous teeth; apex of immobile finger bent over that of dactyl. Ambulatories fringed with long hair; propodi of first three pairs drawn out into sharp ridgelike processes; fourth pair with dactylus less strongly curved. (After Henderson.)

Habit.—Sand burrowing.

Color.—With splotches of vinaceous-cinnamon. (Schmitt.) General color white; two spots in front pink, two at middle light brown; two behind light green. (Henderson.)

Measurements.—Female (45518), length of carapace 22.2, width 14.3 mm.

Range.—Florida to Bahia, Brazil; Panama (Pacific); 10 to 60 fathoms.

Material examined.—See table 6, page 28.

Subtribe DROMIACEA De Haan

Dromiacea DE HAAN, Crustacea Japonica, p. 102, 1839.

Carapace subglobose or subquadrate, frontal region narrow. Last one or two pairs of legs subdorsal in position and also of small size. Abdomen folded under thorax, the penult segment usually without appendages; five pairs of appendages in female, first pair rudimentary. Lateral thoracic apodemata united in a common center, forming a sternal canal. External maxillipeds with merus and ischium subquadrangular.

KEY TO THE SUPERFAMILIES OF THE SUBTRIBE DROMIACEA

A[1]. Sternum of female with longitudinal grooves. Vestiges of sixth abdominal limbs usually present. Gills 14–20 on each side. Eyes usually completely sheltered by orbits when retracted. No *lineae anomuricae* ..... **DROMIIDEA** (p. 27)

A[2]. Sternum of female without longitudinal grooves. No vestiges of sixth abdominal limbs. Gills 8–14 on each side. Eyes incompletely or not at all sheltered by orbits when withdrawn against body. *Lineae anomuricae* usually present ..... **THELXIOPEIDEA** (p. 61)

Superfamily DROMIIDEA Alcock

Dromiens MILNE EDWARDS, Histoire naturelle des Crustacés, vol. 2, p. 168, 1837.

Dromidea HENDERSON, Voyage of H. M. S. *Challenger*, vol. 27, Anomura, p. 2, 1888.

Dromiidea ALCOCK, Journ. Asiat. Soc. Bengal, vol. 68, p. 125, 1899.

Carapace sometimes longer than broad, often broader than long. Eyes and antennules almost always retractile into common orbito-antennulary pits, the lower wall of which is formed about equally by the basal joints of the antennae and antennules and by a suborbital spine or dentiform lobe. These pits often show traces of a division into two fossae. Eyestalk short and stout. Epistome triangular,

TABLE 6.—*Material examined of* Symethis variolosa

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
FLORIDA:	° ′ ″	° ′ ″									
Off Miami			60			— —, 1912		John B. Henderson	2♀	45518	
Do			10–40					do	1♀	47973	
Off Key West			60			June 19, 1893		State Univ. Iowa Bahama Expedition.	1 y.	48891	
Loggerhead Key, Tortugas	About 9 miles S. of Channel buoy.		20			Aug. 16, 1924	2	W. L. Schmitt	1♂	67859	Gift of Carnegie Institution.
PUERTO RICO: N. of	18 30 30	66 23 05	40			Feb. 7, 1933	26	Johnson-Smithsonian Exped.	1♂	67807	
PANAMA (Pacific side): Bahia Honda.	Outside of isle S. of bay.		15–20			Feb. 22, 1934	249	*Velero III*	1♀	69202	Hancock Galapagos Exped.

TABLE 7.—*Material examined of* Dromia erythropus

Locality	*Bearings*	*Depth*	*Bottom*	*Temperature*	*Date*	*Station*	*Collector*	*Specimens*	*Catalog No.*	*Remarks*
FLORIDA:	*Latitude N.*									
Indian Key	Bank	Low tide					H. Hemphill	1 ♀ y.	14059	In sponge.
Tortugas							J. E. Mills	1 ♀ ovig.	655, M. C. Z.	
Do	Fort Jefferson moat				July 16, 1924		W. L. Schmitt	1 ♂	67745	In compound ascidian. Died over night and was partly eaten by other crab. Gift of Carnegie Institution.
Do	Bush Key Reef				June 5, 1925	25–4	do	1 y	66798	In sponge. Gift of Carnegie Institution.
Do		*Feet* 65			June 21, 1931	7	do	1 ♂	67746	Gift of Carnegie Institution.
Off Boca Grande	Boca Grande Light NNE. ⅜ E. 24½ mi. to NE. ¼ N. 20 mi.	12½		68.5	Jan. 2, 1913	7796	*Fish Hawk*	1 y	66807	

BAHAMAS:										
Green Turtle Cay							E. A. Andrews	1 ♂	28986	
Abaco Island		3–15					Allen, Bryant, and Barbour.	1 ♀ 1 y.	M. C. Z.	
CUBA:										
Bahia Honda					1877–78		*Blake*	1 ♂	2931, M.C.Z.	
Cuba							F. Poey	1 ♂	2197	
JAMAICA:										
Kingston Harbor					1893		R. P. Bigelow	1 ♀	17986	
The Palisadoes			Outside beach.				C. R. Orcutt	1 ♀	66809	
Jamaica							C. B. Wilson	1 ♂	42898	
HAITI							Dr. Weinland	1 ♀	M. C. Z.	
PUERTO RICO:										
San Juan							N. Y. Acad. Sci.	2	Amer. Mus.	
Puerto Rico							G. M. Gray	1 y.	28992	
LESSER ANTILLES:										
St. Thomas	French Bay	½–2½				6	C. R. Shoemaker	1 y.	66808	
St. Croix	N. coast	10			1934		H. A. Beatty	1 ♀	69318	
St. Eustatius	Tumble Down Dick Bay.				Aug. 21, 1905		J. Boeke	1 ♂	Leiden Mus.	
Dominica	Soufriere Bay	*Fathoms* 100–200					A. Hyatt Verrill	1 ♂	32708	Depth given is probably the deeper end of haul.
Barbados	Carlisle Bay	Fish pot			1918		State Univ. Iowa Barbados-Antigua Exped.	1 ♀	57907	
Do	Pelican Island		Brought up by diver.				do	1 ♀ ovig.	S. U. I.	
DUTCH WEST INDIES:										
Curaçao	Caracas Bay		Coral		May 13, 1920		C. J. van der Horst	1 y.	56876	
Bonaire	Kralendijk		Under stones		May 12		P. Hummelinck	1 y.	Amsterdam Mus.	
BRAZIL:	*Latitude S.*									
Pernambuco	Santo Aleixo				1876–77		R. Rathbun, Hartt Explorations.	1 ♂	40611	
Ilha de Nogueira	Pernambuco stone reef.				July 10, 1899		A. W. Greely, Branner-Agassiz Exped.	1 ♂ y.	25766	
Bahia					1864		A. Lacerda	1 ♀	M. C. Z.	
Rio de Janeiro	Rat Island							1 y.	M. C. Z.	
State of São Paulo	Villa Bella, Ilha de S. Sebastião.				Nov. 1925		H. Luederwaldt	1 ♀ y.	Mus. Paulista.	

its apex usually in close contact with the deflexed tip of the front. Fingers of chelipeds generally short, stout, and strongly calcified in their distal half. The abdomen of both sexes consists of seven separate segments. Many species are protected by a commensal sponge or ascidian, or by a valve of a lamellibranch shell. (After Alcock.)

KEY TO THE FAMILIES OF THE SUPERFAMILY DROMIIDEA

A¹. Vestiges of sixth abdominal limbs present (except in *Hypoconcha*, where also no mastigobranchs). Carapace usually not longer than broad, with well-marked side edge.
  B¹. Mastigobranchs on first legs (chelipeds) only or on none. Fourth and fifth legs small, subdorsal, and usually prehensile. **Dromiidae** (p. 30)
  B². Mastigobranchs on all of first three pairs of legs. Fifth legs only small and subdorsal ..... **Dynomenidae** (p. 51)
A². No vestige of sixth abdominal limbs. Carapace longer than broad, with ill-marked side edge. First three legs with mastigobranchs, fourth and fifth small, subdorsal, and prehensile ..... **Homolodromiidae** (p. 57)

Family DROMIIDAE Alcock

Dromiidae Alcock, Journ. Asiatic Soc. Bengal, vol. 68, p. 128, 1899.—Schmitt, Univ. California Publ. Zool., vol. 23, p. 183, 1921.

Carapace subglobular, rarely flattened; no *lineae anomuricae* (a pair of longitudinal suture lines on the carapace); sternum of female traversed for more or less of its extent by two obliquely longitudinal grooves. External maxillipeds generally operculiform. Legs of moderate size, fourth and fifth pairs short, subdorsal in position, and furnished with a small, hooklike nail or dactyl. Sixth segment of abdomen generally with rudimentary uropods. (Schmitt.)

KEY TO THE AMERICAN GENERA OF THE FAMILY DROMIIDAE [7]

A¹. Carapace convex, pilose.
  B¹. Sternal sulci of female produced to segment of chelipeds, and approximating in a tubercle ..... **Dromidia** (p. 32)
  B². Sternal sulci of female produced to segment of second pair of feet and not approximate ..... **Dromia** (p. 30)
A². Carapace flat, membranous above ..... **Hypoconcha** (p. 44)

Genus DROMIA Weber

Dromia Weber, *Nomenclator entomologicus*, p. 92, 1795 (*type*, *Cancer dromia* Fabricius, 1793).—Fabricius, Supplementum entomologiae systematicae, p. 359, 1798.—Milne Edwards, Histoire naturelle des Crustacés, vol. 2, p. 170, 1837.—Stimpson, Proc. Acad. Nat. Sci. Philadelphia, 1858, p. 226 [64].

Carapace transverse, convex, pilose. Palate smooth. Sternal sulci of female not approximated, produced to segment opposite second

[7] *Evius* (*E. ruber* Moreira, Bull. Soc. Ent. France, no. 15, p. 322, fig. 1, 2, 1912) may be the larval stage of *Dromia erythropus*. The original figures 1 and 2 have been reproduced on pl. 8.

pair of feet (first pair of ambulatories). Feet mediocre, merus not dilated; digits of first pair with apices calcareous. Four posterior feet smaller, shorter, extremities subcheliform, a spiniform process on penultimate article.

Atlantic coast of Middle and South America; Atlantic coast of Europe, Mediterranean Sea, west and south Africa, Indian Ocean, east Asia.

DROMIA ERYTHROPUS (George Edwards)

FIGURE 11; PLATE 6, FIGURES 1, 2; PLATE 8, FIGURES 1, 2

Cancer marinus chelis rubris CATESBY, The natural history of Carolina, Florida and the Bahama Islands, ed. 1, vol. 2, p. 37, pl. 37, 1743.

Cancer erythropus GEORGE EDWARDS, Catalogue of animals in Catesby's Natural History of Carolina, with the Linnaean names, 1771.

Dromia lator MILNE EDWARDS, Histoire naturelle des Crustacés, vol. 2, p. 174, 1837.

Dromia erythropus RATHBUN, Ann. Inst. Jamaica, vol. 1, p. 39, 1897.—VERRILL, Trans. Connecticut Acad. Sci., vol. 13, p. 430, fig. 50, pl. 28, fig. 2, 1908.

? *Evius ruber* MOREIRA, Bull. Soc. Ent. France, 1912, no. 15, p. 322, figs. 1, 2.[8]

Diagnosis.—Carapace wider than long; anterior half subglobular; posterolateral margins convergent.

Description.—The pair of frontal teeth are larger than the median tooth which forms with them an angle a little larger than a right angle.

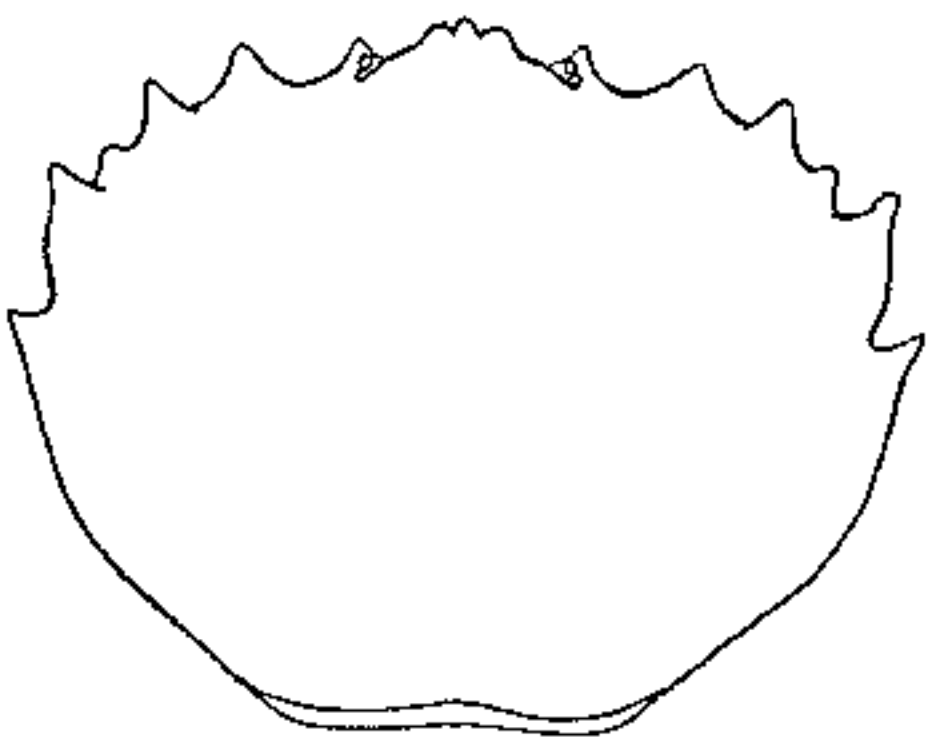


FIGURE 11.—*Dromia erythropus*, male (2197): Outline of carapace and eyes, one-half natural size.

A small shallow tooth above orbit, a large elongate one below. Fronto-orbital distance in the old one-third or less than a third of carapace width. Hairs closely placed; when they are removed from the carapace, a median impressed line is visible leading back to the mesogastric region, faintly outlined; on either side is a prominent rounded lobe. A deep crescentic furrow on each side of the cardiac region nearly meets the curved branchial furrow. A small tubercle at posterior inner angle of branchial region. Four strong conical anterolateral spines; between the second and third a low blunt tooth. Upper border of merus of cheliped marginate, a few minute tubercles above;

[8] Probably the megalops of *Dromia erythropus*.

upper third of outer surface uneven; lower margins sparsely tuberculate or granulate. Outer surface of carpus uneven; two blunt teeth on distal margin, and a blunt spinule at inner angle. Proximal two-thirds of upper margin of palm tuberculated, the line continued part way on the proximal margin. First and second pairs of legs very broad; carpus with a smooth carina on upper margin and a sinuous one on middle of outer surface, terminating in a sharp tooth; on lower margin of dactylus a row of four or five black spines diminishing in size toward the propodus. Third leg stout, merus two and one-half times as long as wide; that of fourth leg narrower, about three times as long as wide; both legs have a slender articulating spine forming a chela with the dactyl; on the last leg there are in addition two shorter and extremely slender movable spines, one above the convex base of the dactyl, the other longer and situated inside of and parallel to the smaller chelate spine.

Color.—Densely covered with dark brown or blackish stiff hairs, only the tips of the dactylus being naked; these are light red. Beneath the hairs the surface is whitish. (Verrill.) Carapace wine purple like some of the sponges in the same haul; exposed fingers of chelae scarlet-vermilion, with white tips. (W. L. Schmitt.)

Habit.—*Dromia* always covers its back with a concave fragment of some living sponge. (Verrill.)

Measurements.—Male (2197), length of carapace 89, width 115.4 mm.

Range.—Florida to Brazil; Bermuda; shallow water to 15 fathoms; 100–200 fathoms (Verrill).

Material examined.—See table 7, page 28.

Genus DROMIDIA Stimpson

Dromidia Stimpson, Proc. Acad. Nat. Sci. Philadelphia, 1858, p. 225 [63] (type, *D. hirsutissima* Lamarck); Smithsonian Misc. Coll., vol. 49, p. 170, 1907.

Carapace convex and pilose, the hair being often of considerable length; front narrow, hepatic regions more or less concave, or excavated anteriorly. The palate is marked by a strong ridge on either side. Sternal sulci in female approximated at their extremities in either a single or more or less bifurcated tuberculiform projection, situated between the bases of the chelipeds. Atlantic and Pacific coasts of North and South America, Hawaiian Islands, Australia, Asia, and South Africa.

KEY TO THE SPECIES OF THE GENUS DROMIDIA

A[1]. Carapace longer than broad, lateral margins of posterior two-thirds subparallel ..... **antillensis** (p. 33)

A[2]. Carapace broader than long, lateral margins of posterior two-thirds converging posteriorly ..... **larraburei** (p. 35)

DROMIDIA ANTILLENSIS Stimpson

FIGURE 12; PLATE 7, FIGURES 1–3

Dromidia antillensis STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 7, p. 71 [25], 1858 (type localities, St. Thomas, Key Biscayne, and Tortugas, Fla.; cotypes in M. C. Z.).—VERRILL, Trans. Connecticut Acad. Sci., vol. 13, p. 431, fig. 51 [?], pl. 28, fig. 3 (not fig. 2, which is *Dromia erythropus*), 1908.—HAY and SHORE, Bull. U. S. Bur. Fish., vol. 35 (1915–16), p. 417, pl. 31, fig. 5, 1918.—BOONE, Bull. Vanderbilt Mar. Mus., vol. 2, p. 42, pl. 7, 1930.

Diagnosis.—Carapace longer than broad, lateral margins of posterior two-thirds subparallel. Fronto-orbital border in adult half width of carapace, in small specimens more than half. The branchial furrow running inward from the last lateral tooth is shallow. Cardiac furrows shallow. Carapace moderately deflexed in front.

Description.—Body everywhere short-pubescent, with longer hairs on sides and feet. Carapace somewhat longer than broad, strongly convex, smooth. Frontal region longitudinally grooved along the

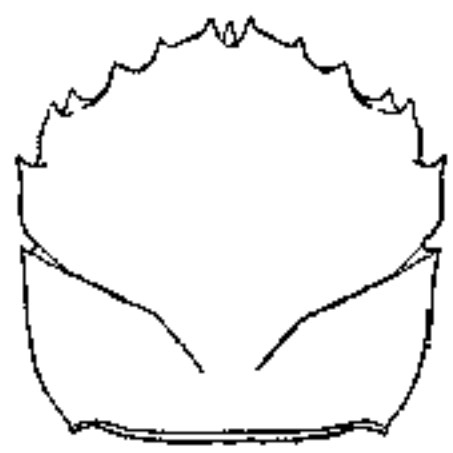


FIGURE 12.—*Dromidia antillensis*, male (42913): Outline of carapace, ×2.

middle. Front strongly deflexed and 5-toothed (supra-ocular teeth included); teeth small and slender, almost spiniform, horizontally projecting; the median three subequal, and about as long as the distance between them at their bases; teeth over the eyes shorter but acute. External angles of orbit prominent but obtuse. Lateral margin of carapace 4-toothed, and deflected anteriorly toward the corners of the buccal area, where there is a tubercle. First three teeth of lateral margin subspiniform; posterior one, situated at lateral sulcus, as large as the others but less acute. External maxillipeds elongate; merus large, longer than ischium, with its antero-exterior corner prominent, forming a right angle. Chelipeds rather short and stout, nearly smooth, inferior edges of ischium and merus-joints granulated; carpus dentated at anterior angles with small teeth; hand short, smooth externally; palm shorter than dactylus, and armed with two or three small spiniform tubercles on basal half of superior margin. Ambulatory legs rather slender, smooth. Last pair of legs much longer than penult pair. Penult joint of abdomen in male elongated and slender; terminal joint longer than broad. (Stimpson.)

Color.—Brownish red, fingers crimson, claws of legs horn color. (Hay and Shore.)

Dirty yellowish green, pincers carmine red with white tips. (Henderson.)

Tortugas: Color of fuzz varies. Gray-white with touch of vinaceous-rufous on proximal upper half of movable finger and a few dots of same color across base of fixed finger (66875); fuzz olive-buff, corneae dark vandyke brown, fingers distally white, basal two-thirds scarlet (65998); general color between a vinaceous-cinnamon and vinaceous-rufous in places; basal two-thirds of finger very light coral-red; palps of maxillipeds and antennular peduncles pale glaucous blue; corneae grayish (drab-gray) with brownish suffusion; thicker antennular flagellum almost orange-vermilion basally; hairs white (66866); largely pinkish vinaceous, with reddish specked corneae with tiny black center, hairs fuzzy, dirty white (66861). Specimen under black sponge with salmon coral-red fuzz, tips of fingers white, a line of scarlet-vermilion at base of fingers demarcating end of fuzz (66872). Orange-buff. Eggs orange-vermilion. Eyes hazel. Fingers of chelae scarlet vermilion with white tips (67744). Carapace about 29 mm wide, coral mud gray, darker on upper surface of chelae and wrists, which seem to have blackish maculations between spines; same coloration on dactyli and propodi of legs. Several hazel spots on carapace more or less symmetrically disposed; near posterior margin two larger bay or blackish bay spots. Fingers peach-blossom pink. Corneae with maculations of same over transparent bay or black central spot; stalk with streak of bay above and white before, making the eyes disappear against the white body. Second specimen almost a slate gray with a slight heliotrope purple cast. Chelae china white distally, orange-vermilion basally. Eye stalks with white streak in front; above slate color, corneae hazel (66860). (W. L. Schmitt.)

Habit.—*Dromidia* carries a covering usually larger than itself, a compound ascidian, a sponge, or a zoanthoid polyp.

Measurements.—Female (66335), length of carapace 37, width 36 mm. The width of carapace may sometimes equal the extreme length.

Range.—North Carolina to Gulf of Mexico and Brazil; Bermuda; shore to 170 fathoms.

Material examined.—See table 8, page 36.

DROMIDIA LARRABUREI Rathbun

FIGURE 13; PLATE 7, FIGURES 4, 5

Dromidia sarraburei (by error) RATHBUN, Proc. U. S. Nat. Mus., vol. 38, p. 553, pl. 48, fig. 4, Oct. 20, 1910 (type locality, Bay of Sechura, Peru; types, U. S. N. M. no. 40475).

Dromidia segnipes WEYMOUTH, Leland Stanford, Jr., Univ. Publ., Univ. Ser., no. 4, p. 15, pl. 1, figs. 1, 2, Nov. 12, 1910 (type locality, Monterey Bay; type in Stanford Univ. Mus.).

Dromidia larraburei SCHMITT, Univ. California Publ. Zool., vol. 23, p. 183, pl. 33, fig. 1, 1921.—RATHBUN, Bull. Amer. Mus. Nat. Hist., vol. 48, p. 619, pl. 33, fig. 1–4, 1923; Proc. California Acad. Sci., ser. 4, vol. 13, p. 374, 1924.

Diagnosis.—Carapace broader than long; lateral margins of posterior two-thirds converging posteriorly. Fronto-orbital border in adult less than half width of carapace, in small specimens half width of carapace. Branchial furrow deeply incised. A deep crescentic furrow either side of cardiac region. Carapace high, in front subglobular.

Description.—Frontal teeth stout, bluntly rounded at tip. External angle of orbit not advanced. Tooth at branchial furrow acute, directed outward and behind a well-marked triangular notch.

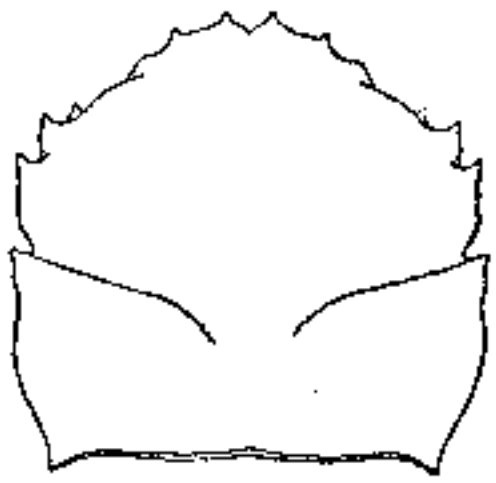


FIGURE 13.—*Dromidia larraburei*, female holotype (40475): Outline of carapace, natural size.

The protuberance on the pterygostomian region, adjacent to the buccal tooth is large and smoothly rounded, not dentiform. The small tubercles on upper surface of palm are ball-shaped, not pointed. Ambulatory legs broader than in *antillensis*, the last two pairs shorter than in that species.

Color.—In alcohol, yellowish tan, tips of chelipeds flesh color; *color in life similar (Weymouth).*

Measurements.—Ovigerous female (41839), length of carapace 32, width 35.6 mm.

Range.—Monterey Bay, Calif., to Peru and Galapagos Islands. Low tide to 60 fathoms.

Material examined.—See table 9, page 42.

TABLE 8.—*Material examined of* Dromidia antillensis

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Depth	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
NORTH CAROLINA:	° ′ ″	° ′ ″	*Fathoms*		°*C.*						
Off Cape Hatteras.	35 21 00	75 21 30	16	gy. S. brk. Sh.		Oct. 19, 1884	2280	*Albatross*	1 y	55971	
Off Beaufort	Fish stomach, off fishing ground.					Aug. 1, 1914		*Fish Hawk*	1 ♂	49120	
Off Cape Fear	33 38 00	77 36 00	15	crs. yl. S. bk. Sp. rot. Co.		Oct. 20, 1885	2619	*Albatross*	1 ♂	14018	
Do	33 37 15	77 35 30	17	crs. yl. S. brk. Sh.		do	2618	do	2 1 y	14016 55967	In ascidian.
FLORIDA:											
Off Miami	Gulf Stream					Nov., 1915		J. B. Henderson	1 ♂	55949	With bopyrid parasite.
Biscayne Bay						1901		J. E. Benedict	1 ♀ ovig	55950	
Off Cape Florida	Key Biscayne							G. Wurdemann	1 ♂	M. C. Z.	Cotype.
Do	Gulf Stream 2⅛ mi SSE. of Fowey Rocks Light	45	rky	21.1	Mar. 25, 1903	7511	*Fish Hawk*	1 ♀ ovig	55946		
Hawk Channel	3½ mi. N. ¾ E. of Sombrero Light.	*Feet* 11½	rky	24.5	Jan. 27, 1903	7427	do	2 ♂ 1 ♀	55936		1 under sponge, 1 under ascidian.
Do	½ mi. SE. by S. of SE. end of Duck Key.	*Fathoms* 2¼	rky	24.5	do	7429	do	1 ♂	55944		
Do	1⅛ mi. E. of S. of W. end of Lower Metacumbe Key.	3		20.5	Feb. 18, 1903	7464	do	1 ♀ ovig	55945		In alga (*Valonia*) with ascidian attached.
Off Key West, inside reef.	Key West Light to E. Channel Bar Buoy, 71°53′ to Beacon "A" 74°46′.	5¼	Co. S. G.	20	Feb. 13, 1902	7278	do	2 y	55966		
West Channel, entrance to Key West	Mid-channel buoy bearing W. by S. ¼ S. ½ mile.	7¾	Co. S.	20	do	7271	do	1 ♂ 1 ♀	55935		
Key West	Dredged							*Bache*; W. Stimpson.	1	3012, M. C. Z.	
Do					1934			H. H. Darby	3 ♂ 2 ♀ ovig	71064	1 ♀ shedding.
Pourtales Plateau.	10 mi. S. of Key West	125						J. B. Henderson	1 ♂	55965	
Sambo Key		120						do	1 ♀	66813	
Sand Key	Reef				May, 1913			do	1 ♀	46049	

Western Dry Rocks.		144					do	1 ♀	66814	In sponge.
Tortugas					1868		J. E. Mills	1 ♂ 1 ♀ ovig	660, M. C. Z.	Cotypes.
Do							do	1 ♂	658, M. C. Z.	Do.
Do							Whitehurst	2	1382, M. C. Z.	Do.
Do					Jan. 5			1 ♀ ovig	21730	
Do	Fort Jefferson				1877–78		*Blake*	1	2932, M. C. Z.	
Do	White Shoals stations		Co. S		July 20, 1924	29	W. L. Schmitt	1 ♂	66875	Gift of Carnegie Institution.
Do	10 mi. S. of southern channel buoy.	45	sft. wh. S		July 22, 1924	43	do	1 ♂	66853	Gift of Carnegie Institution. In ascidian.
Do	NW. of lighthouse, Loggerhead Key.	*Feet* 10–5			Aug. 4, 1924		do	1 left chela	71366	Gift of Carnegie Institution.
Do	E. side Bird Key Harbor.	10			Aug. 8, 1924		do	1 ♀ ovig	66872	Do.
Do	SW. side Bird Key	10			do		do	2 ♂ 1 ♀	66863	Do.
Do	Fort Jefferson moat				Aug. 11, 1924		do	1	Buffalo Mus.	Do.
Do	do				do		do	1 ♀ ovig.	66868	Do.
Do	do				do		do	1 ♂	66866	Gift of Carnegie Institution. In ascidian.
Do	About piles of laboratory dock, Loggerhead Key.				Aug. 22, 1924		do	1 ♀ ovig	67743	Gift of Carnegie Institution. In compound ascidian.
Do	10 or 11 mi. S. of no. 2 red buoy.	*Fathoms* 35–37	crs. S		June 10, 1925	206 or 207	do	1 ♂	66876	Do.
Do	8 mi. S. of no. 2 red buoy.	25			June 11, 1925	217	do	1 ♀ ovig	66874	Do.
Do	Fort Jefferson moat				June 19, 1925		Caswell Grave	1 ♂	66858	Do.
Do	Down channel	10–12	weedy		July 16, 1930	15	W. L. Schmitt	1 ♂	66861	Do.
Do		*Feet* 65			June 21, 1931	7	do	1	65998	Do.
Do		67			June 20, 1931	5	do	2 ♀ ovig	67744	Gift of Carnegie Institution. In sponge.
Do	About opposite and E. of no. 8 red buoy.	About 64			June 26, 1931	13	do	2 ♂ 1 ♀ ovig	66869	Gift of Carnegie Institution, 1 under compound ascidian.
Do	do	About 64			do	13	do	1 ♂ 1 ♀ ovig. (♀ with parasite).	66860	Do.

TABLE 8.—*Material examined of* Dromidia antillensis—Continued

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Depth	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
FLORIDA—Contd.	° ′ ″	° ′ ″	*Feet*								
Tortugas	About opposite and E. of no. 8 red buoy.		About 64			June 26, 1931	13	W. L. Schmitt	1 ♂ and extra house.	66870	Gift of Carnegie Institution. ♂ in large pale sponge, probably *Dysidea*; small unoccupied sponge house is *Verongia*.
Do	From no. 8 red buoy to between black channel and no. 4 red buoy		*Fathoms* 10–11			July 9, 1931	23	do	1 ♂ y	66862	Gift of Carnegie Institution. In ascidian.
Do	S. of Loggerhead Key, no. 2 red buoy.		40			Aug. 4, 1931		Longley and Mantor.	1 ♂ with 2 parasites.	66867	Gift of Carnegie Institution. In sponge.
Do	do		40			do	40	do	3 ♂ 1 ♀	71365	Do.
Do	W. of White Shoal; near and toward shoal in line with buoy.					June 22, 1932	10	W. L. Schmitt	1 ♀ ovig	66865	Gift of Carnegie Institution. Sponge cover.
Do	Channel NE. of Loggerhead Key.					June 23, 1932	12	do	3 ♂ 1 ♀ ovig 3y	66867	Do.
Do	Channel haul NE. of Loggerhead Key.		8–10			do	14	do	1 ♂	66864	Gift of Carnegie Institution.
Do	W. (of White Shoal) channel 18.					June 25, 1932	17+18	do	1 ♂ in sponge; 1 ♀ in bryozoan; *Cupuladria canariensis* (Busk).	66856	Do. ♂ white, ♀ red.
Do	do					do	17+18	do	1 y	66862	Do.
Do	Head of channel E. of White Shoal and black channel buoy.		45			July 7, 1932	37	do	1 ♂ y	66854	Do. In ascidian.
Do	do		45			do	37	do	1 ♀ ovig	66859	Do.
Do			12½–14			July 22, 1932	56	do	1 y	66873	Do. In sponge.
Do	6 mi. E. of Fort					Aug. 6, 1932		do	1 y	66855	Do. In sponge
W. of Tortugas	24 43 00	83 25 00	37			1877–78	11	*Blake*	1 y	2935, M. C. Z.	
Do	24 46 00	83 16 00	36			do	12	do	1 y	2934, M. C. Z.	

								° C.					
Off Cape Sable	24 54 55	81 23 45	3	hrd. S. G.	22.5	Dec. 20, 1902	7387	*Fish Hawk*	1	66335	
N. of Tortugas	25 04 30	82 59 15	26	fne. wh. S. brk. Sh.		Mar. 19, 1885	2414	*Albatross*	5	21727	1 in sponge.
					° F.						
W. of Cape Romano.	25 34 00	82 27 00	15½	gy. S.	67.5	Mar. 3, 1889	5082	*Grampus*	1	28995	
Do	25 34 00	83 07 00	30	fne. S. bk. Sp.	68.5	Mar. 1, 1889	5078	do	2	29000	In ascidian.
W. of Marco	26 00 00	82 57 30	24	fne. S. bk. Sp. brk. Sh.		Mar. 19, 1885	2413	*Albatross*	2 ♀; 7	9919; 21726	In sponges.
Johns Pass E. ¾ N., 9½ mi.			6			Jan. 9, 1913	7804	*Fish Hawk*	1 ♀	66879	
W. of Sanibel Island.	26 16 00		20			Apr. 24, 1872		*Bache;* W. Stimpson.	3	3011, M. C. Z.	
Do	26 18 30	83 08 45	27	fne. gy. S. bk. Sp. brk. Sh.		Mar. 19, 1885	2412	*Albatross*	1	21725	
Do	26 19 00	83 11 00	27	S. Algae	68	Mar. 21, 1889	5108	*Grampus*	1 y	28998	In sponge.
Do	26 19 00	83 22 00	31	S. G. bk. Sp.	67.5	Mar. 18, 1889	5107	do	1	28997	Do.
W. of Charlotte Harbor.	26 33 00	83 10 00	28	sdy.	66	Apr. 2, 1901	7123	*Fish Hawk*	2 y; 1 with 2 parasites.	66851	1 in sponge, 1 in compound ascidian.
Do	26 33 30	83 15 30	27	fne. wh. S. bk. Sp.		Mar. 18, 1885	2411	*Albatross*	2	21724	
SW. of Sarasota Bay.	27 04 00	83 21 15	26	crs. gy. S. brk. Sh.		Mar. 18, 1885	2409	*Albatross*	4	21723	1 in sponge, 2 in ascidians.
Anclote								Thomas Low	1 ♀	28990	
Anclote Keys						Aug. 1929		D. Melissas	1 ♂	Florida State Mus.	
					° C.						
Off Anclote Keys.	28 01 30	83 08 00	11	rky.	13.5	Jan. 23, 1902	7234	*Fish Hawk*	1 ♂; 2 y	55942; 55943	In ascidian.
Do	28 08 30	83 10 00	10	rky. Co.	13.5	do	7231	do	1 ♂ 1 ♀ 1 y	55940	♀ in sponge.
Do	28 19 30	83 01 00	6¼	rky. G.	12.5	Jan. 24, 1902	7239	do	2 y	55948	In ascidians.
					° F.						
Do	Anclote Lt. E. ⅛ S. 14 mi.		8½	Co.	63.95	Jan. 11, 1913	7806	do	1 ♂ 1 y	66878	
					° C.						
St. Martin Reef	28 26 00	83 02 30	7½	rky Co.	13	Jan. 15, 1902	7215	do	1 y	55970	
Do	28 27 00	83 13 00	11	rky. sdy.	14.2	do	7217	do	1 ♀ y	55933	In sponge.
Do	28 34 45	83 08 00	5¾	Co. R. G.	12.5	do	7221	do	1 ♂	55953	
S. of Cape San Blas.	28 45 00	85 02 00	30	gy. S. brk. Co.		Mar. 15, 1885	2405	*Albatross*	2	21721	
Do	28 46 00	84 49 00	26	crs. S. Co.		do	2406	do	10	21722	3 with ascidians.
Do	28 47 30	84 37 00	24	Co. brk. Sh.		do	2407	do	4	9804	
Off NW. end St. Martin Reef.	Near 28 50 00	83 00 00				1887		Lieut. J. F. Moser, U. S. N.	1	21728	
North Key	28 52 45	83 07 00	5¾	rky.	16.1	Dec. 9, 1901	7209	*Fish Hawk*	2 ♀	55938	1 in sponge, 1 in ascidian.
Do	28 54 00	83 30 30	11	R. Co. S.	17	Nov. 28, 1901	7185	do	1 y	55972	
Do	29 05 00	83 22 30	5½	sdy. rky. Co.	15.5	Nov. 27, 1901	7177	do	1 y	55968	
	Between	Between									

TABLE 8.—*Material examined of* Dromidia antillensis—Continued

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Depth	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
Florida—Continued.	° ′ ″	° ′ ″	*Fathoms*								
SW. of Cape San Blas.	29 11 30 and 29 18 15	85 29 00 and 85 32 00	25–27			Feb. 7, 1885	2369–2374	*Albatross*	1 y	66877	
Do	29 18 15	85 32 00	25	crs. gy. S. brk. Sh.		do	2370	do	2	21718	1 in ascidian.
Do	29 15 30	85 29 30	27	g		do	2372	do	1 ♀	9612	In sponge.
Pepperfish Key	29 15 30	83 27 30	5½	sdy	16.2	Nov. 21, 1901	7166	*Fish Hawk*	1 ♂ y	55969	
Do	29 18 00	83 37 00	8	rky	18	do	7161	do	1 ♀; 1 ♂	55934; 55939	In ascidian.
Deadmans Bay	29 37 00	83 35 15	3½	S. G	15	Dec. 6, 1901	7206	do	1 ♂	55947	
Do	29 39 30	83 53 10	7½	S. Co	21.5	Nov. 7, 1901	7152	do	1 ♂	55941	In ascidian.
Do	29 43 40	83 49 45	5¼	Co	20.5	do	7151	do	1 ♀	55937	Do.
Pensacola								Silas Stearns	1 ♂	9375	From fish stomach.
West coast of Florida.								J. E. Benedict	1 ♀ ovig. 3 y	55954	In sponge.
Florida								J. S. Kingsley	1 ♂	56790	From Boston Soc. Nat. Hist. In ascidian.
Do								A. S. Packard	3	M. C. Z	
ALABAMA:											
Off Mobile Bay	29 24 30	88 01 00	35	yl. S. bk. Sp		Mar. 4, 1885	2388	*Albatross*	1	21720	
Do	29 24 00	88 04 00	32	S. G. brk. Sh		do	2387	do	1	21719	
TEXAS: Aransas Pass								J. D. Mitchell	1 1 y	26135 26136	
MEXICO: Off Cape Catoche, Yucatan.	22 28 00	87 02 00	27	fne. wh. Co		Jan. 30, 1885	2366	*Albatross*	2	21717	
CUBA: Between Cape San Antonio and Cape Cajon.			2–12			May 24, 1914	12	*Tomas Barrera*, Henderson and Bartsch.	1 ♂	48602	
BAHAMAS:											
Green Turtle Cay.								E. A. Andrews	1 ♀ ovig	21729	
Spanish Wells, Eleuthera Island.						July 12			1	28991	
Do						July 4, 1903		B. A. Bean	1 ♀ ovig	55951	From Geogr. Soc. Baltimore. With 2 bopyrid parasites. In sponge.

JAMAICA:										
Mosquito Cove						July 27, 1910		E. A. Andrews	1 y	42907	
Montego Bay	Piles, United Fruit Co. Wharf					July 2, 1910		do	1 ♂	42913	In compound ascidian.
Do						July 4, 1910		do	1 ♀	42910	With hydroid covering.
Do						do		do	1 ♀ ovig	42911	With ascidian covering.
Do	Wharf piles.					July 5, 1910		do	1 ♂	42912	Do.
Do	do					do		do	1 ♂	43051	
Do	Piles of R. R. wharf							do	2 ♂ 2 ♀ (1 ovig.)	42914	With ascidian covering.
Do						July 8, 1910		C. B. Wilson	1 ♂ 1 ♀	42897	♂ with ascidian, ♀ with sponge.
Do						July 12, 1910		do	1 ♂	42894	With black ascidian.
Do						do		do	1 ♂	42895	Do.
Do						July 15, 1910		do	1 ♀	42909	
Do								do	2 ♂	42896	With ascidian.
Kingston Harbor						1893		R. P. Bigelow	1 ♂	17991	In colonial anemones.
Do						May-July 1896		F. S. Conant	2 ♀ ovig	19606	
Jamaica								T. H. Morgan	1 ♂ 1 ♀ 1 y	17231	
Do								E. A. Andrews	1 y	42908	
HAITI: Northeast of	19 27 45	69 14 45				Feb. 18, 1933	63	Johnson-Smithsonian Exped.	1 y	67821	
PUERTO RICO:											
Mayaguez				Coral reef		Jan. 23, 1899		*Fish Hawk*	2	28993	1 in ascidian.
Mayaguez Harbor.						*Jan. 20, 1899*		do	3 ♀ (2 ovig.)	28996	2 in ascidians.
Cayo Caribe to Cayo Parguera.								New York Acad. Sci.	1	Amer. Mus.	
Off Culebra Island.	Culebritas lighthouse NE. 5¼ mi.		15	Co		Feb. 8, 1899	6093	*Fish Hawk*	1 y	28994	
VIRGIN ISLANDS:											
St. Thomas			Shore Dredged			Jan. 17-24, 1884		*Albatross*	6	7652	
Do						do		do	1	8931	With sponge.
Do	Lagoons					July 9, 1915		C. R. Shoemaker	1 ♀	65066	
Flanagan Passage.			27	S. brk. Sh	° F. 77¾	1878-79	142	*Blake*	2	2721, M. C. Z.	
St. Croix: Fredericksted Harbor.								New York Acad. Sci.	1	Amer. Mus.	
LEEWARD ISLANDS:											
St. Martin: Groote Baai.				St. Algae		Aug. 1905		Dr. Shaw	1 ♂	Leiden Mus.	
WINDWARD ISLANDS: Off Grenada.	*Latitude S.*		170		53½	1878-79	247	*Blake*	1 y	2933, M. C. Z.	
BRAZIL: Bahia						June 7, 1876		H. H. Smith	1 y	42219	

TABLE 9.—*Material examined of* Dromidia larraburei

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Depth	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″			° F.						
CALIFORNIA: Long Beach.								H. N. Lowe	1 ♀ ovig.	41839	
MEXICO: W. coast of Lower California:											
Off San Martin Island.						Aug. 20, 1932	D. 28 R.	*Zaca*, Crocker Exped.	2 ♀ (1 ovig.)	Cal. Acad. Sci.	
Near Cedros Island						Aug. 15, 1932	D. 26 R.	do	1 ♀ ovig	do	
Cedros Island	Middle of E. side					Mar. 12, 1911		*Albatross*	1 ♀	60056	Early postlarval stage.
Do	27 54 12	115 08 00	*Meters* 33			Sept. 1, 1908	1631	Scripps Institution.	2 ♂ 2 ♀ ovig.	53956	
Santa Maria Bay			*Fathoms* 1½-3			Mar. 18, 1911		*Albatross*	3 ♂ 2 ♀ ovig. 1 y	Scripps Inst. 60060	
Do						Mar. 21, 1933		*Velero III*	20 y	68001	Some in sponge, ascidian, nudibranch. Hancock Galapagos Exped.
Off Thurloe Point, Thurloe Bay.			8-10			Mar. 9, 1934	283	do	1 y	69236	Do.
Magdalena Bay						1917		C. R. Orcutt	1 ♂	50636	
Do			Dead on beach.			Dec. 2, 1931		S. A. Glassell	1 ♂	Glassell coll.	
Do									2 ♂ 2 ♀ ovig.	M. C. Z.	
Do	24 38 00	112 05 30	*Fathoms* 17	fne. gy. S.	65	Apr. 9, 1889	3042	*Albatross*	1 ♂	41841	
Do	24 35 20	111 59 35	13½	S. brk. Sh.		Mar. 21, 1911	5678	do	1 ♀ 1 ♀	59997 59999	In large compound ascidian
Off Magdalena Bay	24 32 00	111 59 00	12	fne. gy. S.		May 2, 1888	2831	do	1 ♂ 2 ♀ 1 y	55959	
Cape San Lucas	Ship's anchorage					1911		do	1 5 mm megalopa.	60055	By electric light. Figured.
Do						do		do	2 3 mm megalopa.	60058	1 Figured.
Do						do		do	3 3 mm megalopa.	1 Amer. Mus. 1 C. J. Fish. 60059	
Lower California						do		do	1 ♀	59998	Soft shell.
MEXICO: Gulf of California:											
Off Espiritu Santo Island.	24 11 30	109 55 00	10	Sh.		Apr. 30, 1888	2828	do	1 ♂	41840	
Do	24 11 45	109 55 00	10	Sh.		do	2827	do	1 ♀	55963	
Off San Jose Island	24 55 15	110 39 00	33	fne. gy. S. brk. Sh.	64.5	Mar. 16, 1889	3001	do	1 ♂	55964	
Carmen Island			20			Dec. 19, 1931		S. A. Glassell	1 y	Glassell coll.	
Do	SE. side					1911		*Albatross*	12.9 mm megalopa	60057	By electric light. Figured.

E. of San Pedro Martir Island.	28 23 45	111 58 00	14	gy. S. brk. Sh.		Mar. 23, 1889	3013	do	1 ♂	55962	
Patos Island anchorage.			4½			Apr. 23, 1921		Fred Baker	1 ♂ 1 y		Returned to sender.
Angel de la Guarda Island.	SE. end		20			Jan. 8, 1932		S. A. Glassell	1 y	Glassell coll.	
Sargents Point, Tepopa Bay, Sonora.			Low tide			Jan. 2, 1932		do	20 y	do	
Punta Peñascosa, Sonora.						Feb. 1934		H. N. Lowe	2 ♂	69403	
San Felipe						May 6-15, 1933		do	1 ♀	67729	In sponge decorated with hydroid.
Off Adair Bay	31 21 15	113 59 00	9½	fne. gy. S	66.1	Mar. 25, 1889	3025	*Albatross*	1 ♂ 1 ♀	55960	1 in zoanthid.
Do	31 22 00	114 07 45	17	G. brk. Sh	65.2	do	3026	do	3 in frags	55958	
COLOMBIA: Port Utria.	Reef inner side, outer isle.		Shore			Feb. 15, 1934	230	*Velero III*	2 y	69621	Hancock Galapagos Exped.
ECUADOR:	*Latitude S.*										
La Plata Island			*45-55*	*S. Shale R*		*Feb. 10, 1934*	212	do	1 ♀ orig	69243	Do.
Galapagos Islands:											
Albemarle Island	Reef N. of Tagus Hill					Mar. 16, 1899		Stanford University.	1 ♀ 2 y	55961	1 in compound ascidian.
Do	S. of Tagus Cove		20			Jan. 13, 1934	149	*Velero III*	1 ♂ 1 ♀	69238	Hancock Galapagos Exped.
Do	North shore			In coral		Jan. 14, 1934	152	do	1 ♂ 1 ♀ ovig. 1 y	69240	Do.
Do	Tagus Cove					Jan. 15, 1934	157	do	3 ♂	69020	Do.
Do	do		12					Stanford University.	5 y	41838	In sponges.
Do	Tagus Cove, S. of cove		30			Jan. 13, 1934	147	*Velero III*	1 y	70768	Hancock Galapagos Exped.
Do	Tagus Cove, reef N. of hill.		Shore			Jan. 15, 1934	154	do	1 ♂	70769	Do.
Do	Tagus Cove, off cove		50-60			do	155	do	1 y	70770	Do.
Do	Cartago Bay			In *Porites*		Jan. 25, 1934	189	*Velero III*, Bob Irwin and H. W. Manter.	1 ♀ ovig	69241	Do.
James Island	Sulivan Bay		5-20			Jan. 23, 1934	177	*Velero III*	1 y	69239	Do.
Do	James Bay		30			Jan. 24, 1934	182	do	1 y	69337	Hancock Galapagos Exped. With shell cover.
Indefatigable Island.	Academy Bay		Dredged			Jan. 20, 1934	169	do	1 ♀	69237	Hancock Galapagos Exped.
Hood Island	Gardner Bay		30	sdy		Jan. 31, 1934	204	do	1 ♀	69242	Do.
Charles Island	Post Office Bay		15			Jan. 15, 1934	167	do	1 y	70771	Do.
Do	Off point		35-40			Jan. 29, 1934	197	do	1 ♀ 1 y	70772	Do.
PERU:											
Paita						Oct. 7, 1926	10	W. L. Schmitt	1 ♂	66791	
Bay of Sechura, W. of Matacaballa.			5			Apr. 8, 1907		R. E. Coker	1 ♀	40475	Holotype, figured. In sponge. Gift of Peruvian Government.

Genus HYPOCONCHA Guérin

Hypoconcha GUÉRIN, Rev. Mag. Zool., ser. 2, vol. 6, p. 333, 1854 [type, *H. sabulosa* (Herbst)].—BOUVIER, Bull. Mus. Hist. Nat., Paris, vol. 4, p. 374, 1898.

Front and lateral margins expanded, covering the eyes and all parts of the head except the flagella of the antennae; middle surface very thin and membranous. Margin of anterior half usually hairy, also the lower surface and appendages. The fourth and fifth pairs of feet are prehensile without being subchelate; dactyl lunate. The shape of the crab has been modified to suit its dwelling or protective covering, for it carries over its carapace the valve of a lamellibranch, holding on by some of its posterior feet and by the angular abdomen inserted under the hinge.

North Carolina to Brazil; Mexico to Peru. Africa (?).

KEY TO THE SPECIES OF THE GENUS HYPOCONCHA

A¹. Merus of outer maxilliped subtriangular, its anterior border longer than lateral border and as long as two preceding articles united ..... **californiensis** (p. 51)

A². Merus of outer maxilliped trapezoid, its anterior border shorter than lateral and shorter than two preceding articles united.

B¹. Three large granulated tubercles forming a triangle on either side of ventral surface of carapace ..... **sabulosa** (p. 44)

B². Not three large granulated tubercles on either side of ventral surface of carapace.

C¹. Distal end of merus of outer maxilliped swollen. A large spine-tipped protuberance on either side of ventral surface of carapace. Spines numerous, upwards of 25 .. **spinosissima** (p. 46)

C². Distal end of merus of outer maxilliped thin.

D¹. Granules of ventral surface of carapace more or less concealed by dense hair.

E¹. Manus with many longitudinal rows of granules and three granulate lobes near fingers; outer face of carpus bordered with hair below and at proximal end and with a raised, granulate line above ... **panamensis** (p. 47)

E². Manus with about 10 pointed and well-separated granules through middle of outer surface; carpus with two distant spines arranged lengthwise ..... **lowei** (p. 50)

D². Granules of ventral surface of carapace plainly visible . **arcuata** (p. 47)

ANALOGOUS SPECIES OF HYPOCONCHA ON OPPOSITE SIDES OF THE CONTINENT

ATLANTIC	PACIFIC
arcuata.	*panamensis*.

HYPOCONCHA SABULOSA (Herbst)

PLATE 8, FIGURES 3, 4; PLATE 9, FIGURES 1–5

Faux Bernard l'Hermite P. NICOLSON, Essai sur l'histoire naturelle de Saint-Domingue, p. 338, pl. 6, figs. 3, 4, 1776.—LAMARCK, Histoire naturelle des animaux sans vertèbres, vol. 5, p. 264, 1818.

Cancer sabulosa HERBST, Versuch einer Naturgeschichte der Krabben und Krebse, vol. 3, pt. 1, p. 57, pl. 48, figs. 2, 3, 1799 [type locality, Africa (probably error)].

Hypoconcha sabulosa GUÉRIN, Rev. Mag. Zool., ser. 2, vol. 6, p. 333, pl. 5, 1854 (figs. 1–5 copied from La Sagra's figs. 1, without color, 5, 7, 9; fig. 6 copied from Nicolson's fig. 3).—LA SAGRA, Historia fisica, politica y natural de la Isla de Cuba, pt. 2, vol. 8, Atlas de zool., Articulata, pl. 1, figs. 1–11 (figs. 10 and 11 copied from Herbst without color), 1855; vol 7, text, p. xiii, 1856 (1857).—STIMPSON, Proc. Acad. Nat. Sci. Philadelphia, 1858, p. 226 [64]; Ann. Lyc. Nat. Hist. New York, vol. 7, p. 72 [26], 1859.—BOUVIER, Bull. Mus. Hist. Nat., Paris, vol. 4, p. 374, 1898.—BENEDICT, Bull. U. S. Fish Comm., vol. 20 (1900), pt. 2, p. 133, 1901.—HAY and SHORE, Bull. U. S. Bur. Fisheries, vol. 35 (1915–16), p. 418, pl. 31, fig. 2 (not 3), 1918.

Diagnosis.—Three large tubercles on either side of ventral surface of carapace. Four stout spines on anterior margin. Chelae covered with small pointed tubercles.

Description.—Carapace in the old pubescent above, margin densely hairy and armed anteriorly with four large curved spines with sharp tips pointing obliquely downward; they are followed by a few small spines, all well spaced. Front between the two submedian spines subtruncate or sometimes sloping slightly backward toward the short narrow fissure on the median line. Lower surface tuberculate and along the margin finely granulate. An uneven transverse ridge directly in front of the hollow in which the cheliped fits; farther forward three large unequal granulated tubercles forming a triangle. Antennary fossae limited in front by a pair of strong, oblique ridges, which arise between two of the spines of the anterior border and meet each other in the middle at the front of the epistome. Posterior border of epistome raised into a prominent ridge, which is continued across the front and some distance along the sides of the buccal area. Peduncular articles of antennae tuberculate; the basal one has a strong, inwardly directed tooth, and the terminal one a tooth on each side of the base of the flagellum. A large swelling on outer side of orbit and a small one above and below. The carpus of the cheliped bears several denticulated tubercles, two of which are on the outer margin; the manus is covered with tubercles more or less pointed.

Color.—Coral sand above, with whitish gray hairs. Ground color beneath, vinaceous-rufous. Rounded bosses on legs and subfrontal region in ventral view vinaceous-cinnamon. Eyes black or bay. Eggs Chinese orange. (W. L. Schmitt.)

Measurements.—Male (66796), length of carapace 23.2, width 22.4 mm.

Range.—North Carolina to the West Indies; 9½ to 49 fathoms.

Material examined.—See table 10, page 48.

HYPOCONCHA SPINOSISSIMA Rathbun

FIGURE 14; PLATE 10, FIGURES 1, 2

Hypoconcha spinosissima RATHBUN, Proc. Biol. Soc. Washington, vol. 46, p. 185, 1933 (type locality, off Cape Hatteras, N. C., 49 fathoms; holotype, ovigerous female, U.S.N.M. no. 55957).

Diagnosis.—One tubercle on either side of ventral surface of carapace. Many spines on carapace, chelipeds, and other appendages.

Description.—Carapace broader than long, short pubescent above, hairy all over below, especially in the old; front subtruncate between antennae; a short wide median fissure is followed by a shallow furrow; anterolateral margin sinuous. Ventral surface granulate, granules sparser on the carapace than on the appendages. Spines are dis-

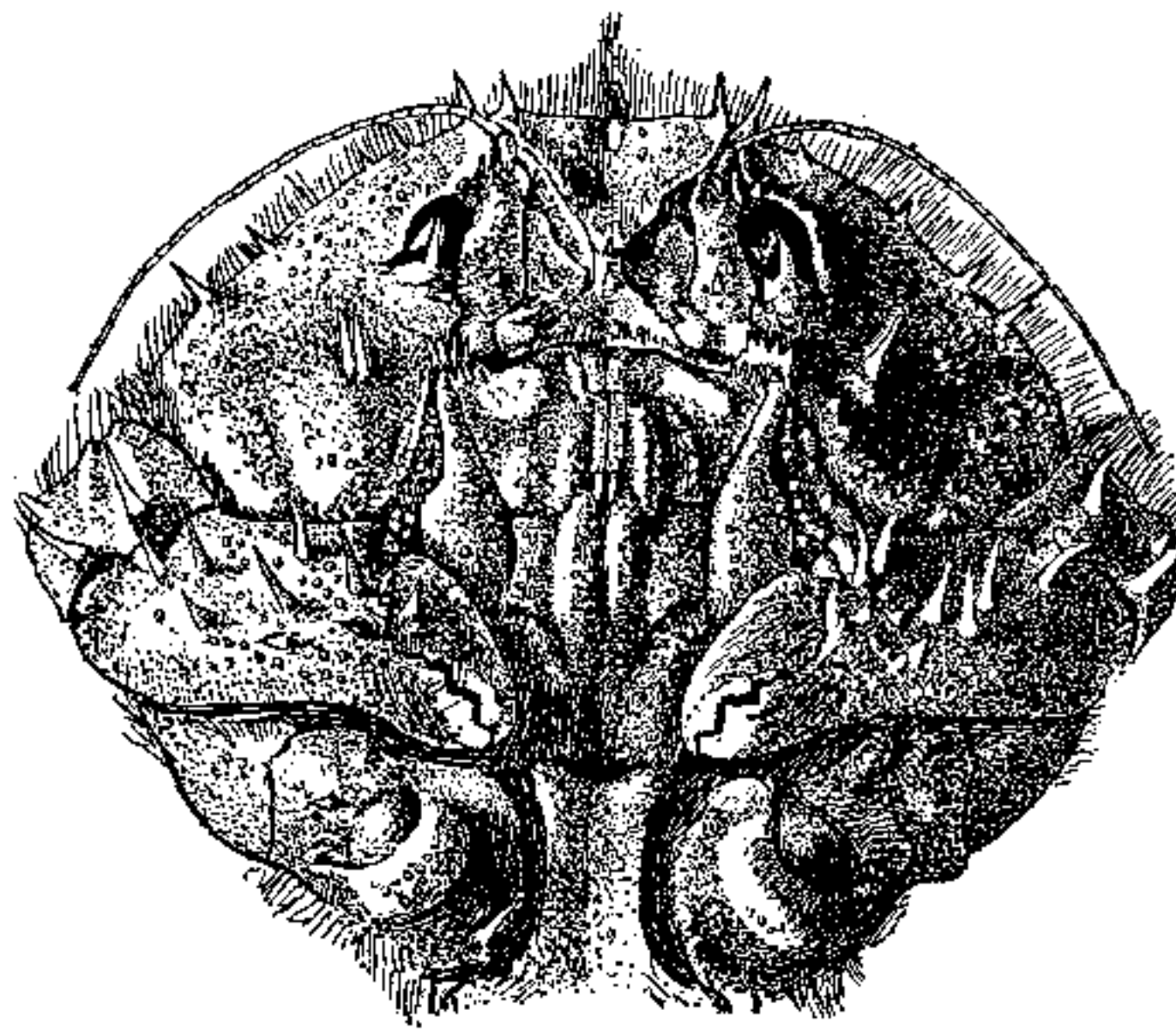


FIGURE 14.—*Hypoconcha spinosissima*, female holotype (55957): Ventral view, enlarged.

tributed as follows: Five or six at the angle of the margin of the deflexed front; a longer spine where the epistome joins the front; a strong, curved spine above and below the middle of the orbit; one or two slender spines on a protuberance of the carapace in horizontal line with buccal angle; three spines on carpus of cheliped; 9 or 10 spines on outer surface of manus, irregularly disposed in three rows; a possible spine on outer surface at base of dactyl; a spine on coxa and ischium of cheliped and first ambulatory. A row of short spines and tubercles on border of epistome; a row of six or seven very slender curved spines at outer angle of merus of maxilliped; an elongate swelling lies just inside and parallel to the distal margin of merus.

Color.—Generally pinkish buff, darker parts salmon color, fringing hairs primrose yellow.

Measurements.—Ovigerous female, holotype (55957), length of carapace 16.6, width 18 mm. Largest specimen, male (66793), length of carapace 23.5, width 24 mm.

Range.—North Carolina to Yucatan and Jamaica; 14 to 60 fathoms.

Material examined.—See table 11, page 48.

HYPOCONCHA ARCUATA Stimpson

PLATE 11, FIGURES 1–4

Hypoconcha arcuata STIMPSON, Proc. Acad. Nat. Sci. Philadelphia, 1858, p. 226 [64]; *nomen nudum*, Ann. Lyc. Nat. Hist. New York, vol. 7, p. 72 [26], 1859 (type localities, South Carolina and St. Thomas; types not extant).—BOUVIER, Bull. Mus. Hist. Nat., Paris, vol. 4, p. 375, 1898.—BENEDICT, Bull. U. S. Fish Comm., vol. 20 (1900), pt. 2, p. 133, 1901.—HAY and SHORE, Bull. U. S. Bur. Fisheries, vol. 35 (1915–16), p. 418, pl. 31, fig. 3 (not 2), 1918.

Diagnosis.—Lower surface everywhere granulate. No tubercles on carapace; many small spines on margin of anterior half. Chelae densely and coarsely granulate, rough along middle line.

Description.—Lateral lobe of carapace strong. Front margin densely ciliated, nearly semicircular in outline, a shallow V at middle, followed by a "buttonhole" in the old, or a short open fissure prolonged for some distance by a shallow sulcus. A minute notch either side of middle, continued on the under side by a narrow fissure in front of the eye for the lodgment of the antennary flagellum; outer posterior margin of orbit fissured. Granules of carapace larger than those of appendages. Distal and outer margins of merus of maxilliped thin and meeting at a prominent sharp angle. Carpus of cheliped as broad as long, granules crowded. Granules heaped up and acute through middle of palm.

Measurements.—Female (53404), length of carapace 12, width 13 mm. Male (S. U. I.), length of carapace 23.6, width 23 mm.

Range.—North Carolina to Brazil; 1 to 22 fathoms.

Material examined.—See table 12, page 49.

HYPOCONCHA PANAMENSIS Smith

PLATE 9, FIGURES 6, 7

Hypoconcha panamensis SMITH, *in* Verrill, Amer. Nat., vol. 3, p. 249, 1869 (type locality, Panama, under valve of *Pecten ventricosus;* type in P. M. Y. U.).—BOUVIER, Bull. Mus. Hist. Nat., Paris, vol. 4, p. 375, 1898.—RATHBUN, Proc. U. S. Nat. Mus., vol. 38, p. 594, 1910.

Hypoconcha digueti BOUVIER, Bull. Mus. Hist. Nat., Paris, vol. 4, p. 374, 1898 (type locality, La Paz Bay; type in Paris Mus.).—RATHBUN, Bull. Amer. Mus. Nat. Hist., vol. 48, p. 620, 1923.

Hypoconcha peruviana RATHBUN, Proc. U. S. Nat. Mus., vol. 38, p. 553, pl. 47, fig. 2, 1910 (type locality, Matapalo; type, U. S. N. M. no. 40474).

Diagnosis.—A prominent crescentic lobe on the carapace either side of buccal region. Carpus and manus of cheliped with a raised line of granules above; carpus bordered with hair below and at proximal end; manus with several longitudinal rows of granules outside and three granulated lobes near the fingers.

TABLE 10.—*Material examined of* Hypoconcha sabulosa

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″									
NORTH CAROLINA: Off Cape Hatteras.	35 08 30	75 10 00	49	gy. S		Oct. 17, 1885	2596	*Albatross*	1 ♂ 1 ♀ ovig.	11271	
FLORIDA:											
Inside Sombrero								*Bache*; W. Stimpson.	1 ♀	3015, M.C.Z.	
Florida Keys			13			Apr. 19, 1872		do	1 ♀	3014, M.C.Z.	
Tortugas	Not far from Nun buoy		11½			June 20, 1931	5	W. L. Schmitt	1 ♀ ovig.	67741	Gift of Carnegie Institution.
Do	Channel between White Shoal and Loggerhead Key.		9½			June 21, 1931	6	do	2 ♂	66796	Do.
W. of Tortugas	24 43 00	83 25 00	37			1877–78	11	*Blake*	1 ♂	6324, M.C.Z.	
S. of St. George Island	28 46 00	84 49 00	26	crs. S. Co		Mar. 15, 1885	2406	*Albatross*	1 ♀	66811	
Do	28 47 30	84 37 00	24	Co. brk. Sh		do	2407	do	1 ♀	65811	
JAMAICA: Harbor Head								C. R. Orcutt	1 ♀	66787	

TABLE 11.—*Material examined of* Hypoconcha spinosissima

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″									
NORTH CAROLINA:											
Off Cape Hatteras	35 08 30	75 10 00	49	gy. S		Oct. 17, 1885	2596	*Albatross*	1 ♂ ovig.	56957	Holotype.
Off Cape Lookout	34 37 30	75 39 45	34	yl. S. brk. Sh		Oct. 18, 1885	2604	do	1 ♂	55955	
FLORIDA:											
Tortugas	S. of Loggerhead Key		45			June 10, 1925	210	W. L. Schmitt	1 y	66794	Gift of Carnegie Institution.
Do	12 mi. S. of no. 2 red buoy.		60			July 22, 1931	33	do	1 ♂	66795	Do.
S. of St. George Island	28 46 00	84 49 00	26	crs. S. Co		Mar. 15, 1885	2406	*Albatross*	1 ♂	66793	
S. of Cape St. George	28 45 00	85 02 00	30	gy. S. brk. Co		do	2405	do	1 ♀	21700	
SW. of Cape San Blas	29 11 30 to 29 18 15	85 29 00 to 85 32 00	25–27			Feb. 7, 1885	2369–2374	do	2 ♀	66792	
YUCATAN: 16 mi. N. of Holbox [Jolbos] Island.			14			1877–78	39	*Blake*	1 ♂	3016, M. C. Z.	
JAMAICA						Mar. 1–11, 1881		do	1 ♂	7696	

TABLE 12.—*Material examined of* Hypoconcha arcuata

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
NORTH CAROLINA:	° ′ ″	° ′ ″									
Off Cape Lookout	34 26 00	76 12 00	22	fne. gy. S.		Oct. 19, 1885	2609	*Albatross*	1 ♂	11352	
Off Cape Fear	33 45 00	77 25 00	18	gy. S.		Oct. 20, 1885	2615	do	3 ♂ 1 ♀	11351	
Do	33 37 30	77 26 30	14	crs. yl. S. brk. Sh.		do	2617	do	1 ♀	42220	
Do			7			1862		L. F. Pourtales	1 ♀	M. C. Z.	
FLORIDA:											
Florida Bay								Union College collection	1 ♀ 2 ♂	42221 42222	
Tortugas						June 5–8, 1893		State Univ. Iowa Bahama Exped.	1 ♂	S. U. I.	
West Florida						Apr. 24, 1872	2	*Bache;* Wm. Stimpson	1 y.	3019, M. C. Z.	
Do	26 16 00		16			do	5	do	1 y.	3018, M. C. Z.	
Do	do		19					do	2 (1 y.)	3017, M. C. Z.	
Sanibel Island Light	NE. ¼ mi.		4¾	Sh. wh. M.		Jan. 1, 1912	7795	*Fish Hawk*	1 ♀	66810	
Caxambas						1919		George Mott	1 ♀	53404	
Marco			1–3					Henry Hemphill	3	6978	
Sarasota Bay								Union College collection	1 ♀ ovig.	42223	
BRAZIL:	*Latitude S.*										
Maranhão						1865–66		Thayer Exped.	1 ♂	M. C. Z.	
Victoria, Espirito Santo.						do		Hartt and Copeland, Thayer Exped.	1 ♂	M. C. Z.	

Description.—Allied to *H. arcuata.* Carapace in the old hairy above and below, concealing the granules; in the young the surface is nearly bare. Anterior margin broadly rounded, edge broken by a marked median incision and by distinct notches at insertion of the antennae. Four or five white subspiniform teeth on each frontal lobe; and 8 or 10 on each margin of the carapace behind these lobes. Some obtuse denticles irregularly disposed and little prominent on the supero-external border of the orbit, as on the inferior lobe. Lower surface of facial region sparsely granulated, granules separated by smooth spaces. Merus of outer maxilliped more plainly squarish than in *H. sabulosa;* its anterior border is much shorter than the lateral borders and scarcely longer than half the total length of the two preceding articles. The endostome has two broad, obtuse, longitudinal prominences. The large granules on the outer surface of the manus are concentrated on the middle half; they are numerous on the superior face of the dactyl and the inferior face of the fixed finger; the carpus, beside the prominent border, has a spinule at the distal corners.

Color.—Uniformly reddish (Bouvier).

Measurements.—Male (66790), length 12.7, width 13.3 mm. Female (40474), length 18, width 19.5 mm.

Range.—Mexico to Peru; 3 to 60 fathoms.

Material examined.—See table 13, page 52.

HYPOCONCHA LOWEI Rathbun

PLATE 8, FIGURES 5, 6

Hypoconcha lowei RATHBUN, Proc. Biol. Soc. Washington, vol. 46, p. 149, 1933 (type locality, San Felipe, Gulf of California; type female, U.S.N.M. no. 67575).

Diagnosis.—Carapace not produced laterally in a narrow lobe. A strong, conical spine on lower border of orbit. Two spines in a longitudinal row on carpus of cheliped.

Description.—Surface hairy above and below. Anterior margin of carapace arcuate, very slightly sinuous. Lateral angle bluntly rounded, not forming a distinct lobe as in *H. sabulosa* and kindred species; posterolateral borders rapidly converging. A marginal row of four distant spines on either side of the front, the anterior spine over the orbit. Lower surface of carapace mottled with acute granules but not sculptured. A short spine at angle of buccal cavity. Ischium of outer maxilliped coarsely granulate. Carpus of cheliped with two long spines inclined distad in a median row. About 10 or 12 pointed tubercles scattered through middle of outer surface of manus; fingers finely granulate.

Measurements.—Male, length of carapace 16.4, width 17 mm. Female holotype, length 20, width 22.3 mm.

Range.—Mexico to Ecuador; to a depth of 55 fathoms.

Material examined.—See table 14, page 53.

HYPOCONCHA CALIFORNIENSIS Bouvier

PLATE 10, FIGURES 3, 4

Hypoconcha californiensis BOUVIER, Bull Mus. Hist. Nat., Paris, vol. 4, p. 374, 1898 (type locality, San Jose Island, Gulf of California; type in Paris Mus.).

Diagnosis.—Margin of carapace with short, dense hairs. Merus of maxilliped subtriangular, its anterior margin longer than the lateral margin and as long as the two preceding articles united. Carapace slightly pilose below.

Description.—The subacute teeth bordering the carapace number three on each median frontal lobe and six on each side between the superior orbital notch and the point where the carapace is widest; the inferior orbital border has five spines on each side. Median furrow of frontogastric region scarcely indicated. The anterolateral walls of the buccal cavity present a strong flap directed inward, upon which is supported the anterior border of the merus of the outer maxilliped; the upper wall of the endostome is armed on either side with a prominent ridge, which has a denticle at its middle. Merus of outer maxillipeds three times as wide on the anterior border as on the border in contact with the ischium; length of merus equal to that of the two basal articles together. Chelae with numerous tubercles on outer face; some almost continuous (on thumb and neighboring palmar portion), some widely separated; they become very small on the lower border where they form an inconspicuous longitudinal row; a stronger tubercle, terminating in two points, occupies the middle of the external base of the hand. The greater number of these tubercles are acute or subacute; they occur also on the flat outer face of the carpus, where they form two rows which converge a little from behind forward. (After Bouvier.)

Color.—In formalin a uniform reddish.

Measurements.—Female, type, length of carapace 12.5, width 13.5 mm (Bouvier). Male (42224), length and width 6 mm.

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

Material examined.—Off Cerralvo Island; lat. 24°11′30″ N., long. 109°55′00″ W.; 10 fathoms; shells; April 30, 1888; station 2828, *Albatross;* 1 male (42224). Panama: Near Changone, Taboga Island, dredged December 24, 1933; 1 male, 1 female (69407); E. D. Robson collector.

Family DYNOMENIDAE Ortmann

Dynomenidae ORTMANN, Zool. Jahrb., vol. 6, p. 541, 1892; *in* Bronn's Klassen und Ordnungen des Thier-Reichs, vol. 5, pt. 2, Arthropoda, p. 1155, 1901.—ALCOCK, Journ. Asiat. Soc. Bengal, vol. 68, pt. 2, p. 127, 1899; Catalogue of the Indian decapod Crustacea in the collection of the Indian Museum, fasc. 1, p. 34, 1901.

Dynomeninae A. MILNE EDWARDS and BOUVIER, Crustacés décapodes provenant des campagnes du yacht *l'Hirondelle* (supplément) et de la *Princesse-Alice*, fasc. 13, p. 9, 1899; Mem. Mus. Comp Zool., vol. 27, p. 22, 1902.

TABLE 13.—*Material examined of* Hypoconcha panamensis

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″									
MEXICO:											
Angeles Bay, E. coast Lower California.			20			Jan. 4, 1932		S. A. Glassell	2 ♂	Glassell coll.	
San Estaban Island, Gulf of California.						Apr. 13, 1911		*Albatross*	1 ♀	60001	
Punta Peñascosa, Sonora.						Feb. 1934		H. N. Lowe	1 ♂ 1 ♀	69403	
Off Cerralvo Island, Gulf of California.	24 11 30	109 55 00	10	Sh		Apr. 30, 1888	2828	*Albatross*	2 ♂	42228	
Braithwaite Bay, Socorro Island.	18 43 00	110 57 00	40			Jan. 4, 1934	132	*Velero III*	1 y	69253	Hancock Exped. Galapagos
Acapulco						April, 1930		H. N. Lowe	2 ♂	66790	
COSTA RICA:											
Puerto Culebra	In bay		10			Feb. 24, 1934	253	*Velero III*	1 y	69248	Hancock Exped. Galapagos Soft shell.
Do	do		3-10			do	254	do	3 ♂ 1 ♀ ovig. 3 y	69246	Hancock Exped. Galapogos
Do	Dredging around isles in bay.					Feb. 25, 1934	257	do	2 ♂ 5 ♀ (1 ovig. 2 y	69255	Do.
PANAMA:											
Secas Islands	S. of group		25	M. dead Sh		Feb. 22, 1934	250	do	1 ♀	69247	Do.
Do	S. and W. of group		15	Nullipores		do	251	do	1 y	70766	Do.
Bahia Honda	Outside of isle S. of bay		16-20			do	249	do	2 ♂ 2 ♀	69254	Do.
Taboga Island						June 15, 1924		Elizabeth Deichmann.	1 ♀	66788	
Do								E. D. Robson	1 ♀ ovig.	69405	
Tortola Island	Dredged					Nov., 1933		do	1 ♂		Returned to sender.
Panama									1		M. C. Z.
COLOMBIA:											
Gorgona Island	N. end of isle		shore			Feb. 12, 1934	218	*Velero III*	1 ♂ 1 ♀	69326	Hancock Exped. Galapagos
Do	W. side		20			do	226	do	1 ♀	69249	Do.
Do	Near beach, W. side		8-10			do	225	do	1 ♀ ovig.	69416	Do.
Do	Near Gorgonilla Channel.		15	M		do	228	do	8 ♂ 1 ♀ ovig.	69252	Do.
Do	do		15	M		do	228	do	2 y	70767	Do.

ECUADOR:	*Latitude S.*										
Galapagos Islands	1 21 00	89 40 15	40	Co. S		Apr. 7, 1888	2813	*Albatross*	1♀	66789	
Do	0 55 00	90 30 00	58–60			*Jan. 26, 1934*	*190*	*Velero III*	*1y*	*69251*	Hancock Galapagos Exped.
Do	0 55 00	90 30 00	58–60			do	190	do	1y	69765	
Off Charles Island	1 03 30	90 17 30	56	Oyster dredge		Feb. 5, 1933	55	do	1♀	68260	Do.
Do	N. of Postoffice Bay		25–40			Jan. 30, 1934	200	do	1 ♂	69245	Do.
Albemarle Island, Tagus Cove.	S. of Cove		30			Jan. 13, 1934	147	do	2 ♂	69250	Do.
Do	do		30			do	147	do	1y	69764	Do.
Do	do		30			do	147	do	1♀	69340	With shell cover.
James Island	James Bay		30			Jan. 24, 1934	182	do	1♀	69338	Do.
PERU: Oyster beds of Matapalo near Capon.						Feb. 3		R. E. Coker	1♀	40474	Type of *H. peruviana*. Under valve of *Chione asperrima* Sowerby.

TABLE 14.—*Material examined of* Hypoconcha lowei

Locality	Bearings	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
MEXICO:	*Latitude N.*									
San Felipe, gulf coast of Lower California					May 6–15, 1933		H. N. Lowe	5 ♂ 5 ♀. 2 ♂ 1 ♀.	67734. Returned to sender.	1♀ is type.
Do		8			June 2, 1934		S. A. Glassell	2y	Glassell collection.	
ECUADOR:	*Latitude S.*									
La Plata Island		45–55	S. Shale, R.		Feb. 10, 1931	212	*Velero III*	1y	69256	Hancock Galapagos Exped.
La Libertad	N. of point St. Elena	8–10			Feb. 9, 1931	209	do	4y	69257	Do.
Do	Between La Libertad and Salinas.	7–10			do	210	do	2y	69258	Do.

Carapace either longer than broad and convex, or broader than long and flattish, the lateral borders well defined. Front broadly triangular, sometimes notched at tip. Antennal flagella not so long as carapace. External maxillipeds typically opercular, completely closing the buccal cavern. Chelipeds equal or slightly unequal, generally stouter than legs. First three pairs of legs stout, about as long as chelipeds; fourth pair dorsal and rudimentary. The abdomen in both sexes consists of seven segments, and there is a pair of lateral platelets intercalated between the last two segments. The gills are phyllobranchiate. The sternal grooves of female end at level of genital openings. (After Alcock.)

KEY TO THE GENERA OF THE FAMILY DYNOMENIDAE

A[1]. Carapace flattish, broader than long, pilose.....**Dynomene** (p. 54)
A[2]. Carapace convex, longer than broad, spinose.....**Acanthodromia** (p. 55)

Genus DYNOMENE Latreille

Dynomene LATREILLE, *in* Desmarest, Considérations générales sur la classe des Crustacés, p. 133, footnote, 1825; *in* Cuvier, Le règne animal, ed. 2, vol. 4, p. 69, 1829 (type, *D. hispida* Desmarest).—MILNE EDWARDS, Histoire naturelle des Crustacés, vol. 2, p. 179, 1837.—ORTMANN, *in* Bronn's Klassen und Ordnungen des Thier-Reichs, vol. 5, pt. 2, Arthropoda, p. 1155, 1901.—ALCOCK, Journ. Asiat. Soc. Bengal, vol. 68, pt. 2, p. 133 and synonymy, 1899; Catalogue of the Indian decapod Crustacea in the collection of the Indian Museum, fasc. 1, p. 35, 1901.
Maxillothrix STEBBING, Ann. South Afr. Mus., vol. 18, pt. 4, p. 456, 1921 (type, *M. adaeiformis* Stebbing).

All parts usually tomentose. Carapace subcircular or polygonal, flattish, slightly broader than long. Front broadly triangular, dorsally grooved, more or less distinctly notched or divided at tip. Palate well delimited from epistome; efferent branchial channels well defined. Feet of fourth pair very small, not prehensile, dorsal in position and inconspicuous.

Indo-Pacific, from Mauritius and Madagascar to Mexico; tropical Atlantic in neighborhood of Cape Verde Islands.

DYNOMENE URSULA Stimpson

PLATE 12, FIGURES 1–4

Dynomene ursula STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 7, p. 239 [111] 1860 (type locality, Cape St. Lucas; type not extant).

Diagnosis.—Lateral margin of front regularly curved, not sinuate. Dactyls of first three ambulatories setose, tips black. Hind pair of feet setose like the others, dactyls without pigment.

Description.—The whole upper surface is covered with stout thick setae of two kinds; the first kind very short, clavate, or even pedicellate, and densely crowded; the second long and nearly as thick as the first, but fusiform, with pointed extremities, and sparsely distributed

over the surface, generally in groups of three or four, of unequal lengths. Surface of carapace beneath the setae densely granulated; granules not prominent; sulci defining areolets of moderate depth. Anterolateral margin as long as posterolateral, regularly curved and armed with five small spines, not including that at angle of orbit. Front low-triangular; margin somewhat arched, and continuous with the superior margin of orbit, which forms a low projection opposite the juncture of the cornea of the eye with its peduncle. Dactyls of ambulatory feet setose and have black, much-curved unguiculi.

Color.—More or less reddish or crimson; setae of a light golden color.

Measurements.—Male (68316), length 20.4, width 27.2 mm. Female (68314), length 16.5, width 21.8 mm.

Habit.—Stimpson says [9] of the last pair of feet, "not prehensile, since the animal does not cover itself with a foreign body like the Dromiae; and they fill, apparently, no office in the economy of the animal, except when in place, they fill up neatly the chink between the carapax and the stouter walking feet."

Range.—West coast of Mexico to Galapagos Islands.

Material examined.—See table 15, page 56.

Genus ACANTHODROMIA A. Milne Edwards

Acanthodromia A. Milne Edwards, Bull. Mus. Comp. Zool., vol. 8, p. 31, 1880 (type, *A. erinacea* A. Milne Edwards).—Bouvier, Bull. Soc. Philom. Paris, ser. 8, vol. 8, p. 56 [23], 1896.—Alcock, Journ. Asiat. Soc. Bengal, vol. 68, p. 134, 1899; Catalogue of the Indian decapod Crustacea in the collection of the Indian Museum, fasc. 1, p. 36, 1901.—Ortmann, *in* Bronn's Klassen und Ordnungen des Thier-Reichs, vol. 5, pt. 2, Arthropoda, p. 1155, 1901.—A. Milne Edwards and Bouvier, Mem. Mus. Comp. Zool., vol. 27, p. 22, 1902.

Differs from *Dynomene* in having the carapace longer than broad, convex, closely covered with spines instead of hairs.

Caribbean Sea; Andaman Sea; 75 to 150 fathoms.

ACANTHODROMIA ERINACEA A. Milne Edwards

Plate 12, Figures 5, 6

Acanthodromia erinacea A. Milne Edwards, Bull. Mus. Comp. Zool., vol. 8, 1880 (type localities, off Guadeloupe, 150 fathoms; type in M. C. Z.).—Bouvier, Bull. Soc. Philom. Paris, ser. 8, vol. 8, p. 56 [23], fig. 18–21, 1896.—A. Milne Edwards and Bouvier, Mem. Mus. Comp. Zool., vol. 27, p. 23, pl. 3, fig. 5–15; pl. 4, fig. 1–4; text fig. 7, 8, 1902.

Diagnosis.—Long spines predominate in dorsal aspect. Upper margin of orbit slightly concave. A single smooth tubercle on fourth and on fifth abdominal segment; terminal segment triangular.

[9] *Op. cit.*, p. 240 [112].

TABLE 15.—*Material examined of* Dynomene ursula

Locality	Bearings	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
MEXICO:	*Latitude N.*									
Ensenada de los Muertos, Gulf of California.					Jan. 24, 1932		S. A. Glassell	2♀	Glassell coll.	
Maria Madre Island					Mar.-May, 1927.		Secretaria de Agricultura y Fomento, through L. Herrera.	1♂	61519	
Puerto Angel, Oaxaca					1910		C. R. Orcutt	2♀	50923	
NICARAGUA: San Juan del Sur.					Feb. 1931		H. N. Lowe	1♀	68461	
ECUADOR:	*Latitude S.*									
La Plata Island		45–55	S. R. Shale		Feb. 10, 1934	212	*Velero III*	1♀	69339	Hancock Exped. Galapagos
Galapagos Islands:										
Hood Island	Gardner Bay				Jan. 24, 1933	24	do	1♀	68319	Do.
Do	do				Jan. 25, 1933	27	do	2♀	68322	Do.
Do	do	2			do	28	do	1♀	68320	Do.
Do	do				Jan. 26, 1933	30	do	2♂3♀	68313	Do.
Charles Island	Black Beach anchorage.				Jan. 27, 1933	33	do	6♂2♀ (1 ovig.)	68314	Do.
Do	SE. of Cormorant Point.				Jan. 29, 1933	38	do	3♂1♀	68315	Do.
Barrington Island					Feb. 2, 1933	48	do	1♀	68318	Do.
Albemarle Island	Reef N. of Tagus Hill.				Feb. 9, 1933	65	do	1♂	68321	Do.
Do	do				Jan. 15, 1934	154	do	3♀	69335	Do.
Do	S. of Point	12–15			Jan. 13, 1934	148	do	1♀4y	69342	Do.
Do	Albemarle Point				Feb. 11, 1933	69	do	9♂10♀	68312	Do.
Do	Cartago Bay				Feb. 13, 1933	73	do	10♂14♀ (3 ovig.)	68317	Do.
Do	do				Feb. 14, 1933	76	do	8♂9♀ (3 ovig.)	68316	Do.
Do	do				Jan. 25, 1934	189	do	1♀y	69244	Do.
James Island	James Bay				Feb. 12, 1933	71	do	1♂1♀	68323	Do.
Do	do				Jan. 24, 1934	182 or 183	do	1y	69753	Do.
Tower Island	Darwin Bay				Feb. 22, 1933	94	do	1♂1♀	68324	Do.

Description.—Body and feet everywhere bristling with numerous large spines; some smaller spines in the intervals. Carapace regularly convex from front to rear and transversely, sutures indistinct. Front forming a beak, very advanced and deflexed; margin of front and orbits furnished with a row of close-set spines. Orbits very oblique. Basal article of antenna spinous, closing the orbit below; basal article of antennule also spinous. The epistomian point joins the front. Eyestalk spinous, two curved spines overhanging the cornea. Chelipeds equal, short, very spinous outside, and with spiniform tubercles within; fingers spooned, the propodal finger denticulate, the dactyl with only two terminal denticles and a proximal notch. Last pair of feet much reduced, chelate, not surpassing in length the merus of the preceding foot. Abdomen of mature female thick, narrow, sides parallel from first to sixth segment; armed with spinules and numerous spines; fourth segment with a large, median lobe near anterior border, *which is smooth except for a longitudinal sulcus on proximal half;* a similar lobe, much smaller, on fifth segment; on these two articles spines are scarce on median line, forming a sort of wide gutter, which is continued to middle of terminal segment; lateral pieces of sixth article very small. Thoracic sternum smooth, very concave, with a crest a little inside the base of the chelipeds and the next three ambulatories; a transverse crest between the bases of second and third ambulatories.

Measurements.—Female (9547), length of carapace without spines 11.5, with spines 12.3, width without 9.6, with spines 11 mm. Length of holotype without rostral spine 17 mm.

Range.—Caribbean Sea.

Material examined.—Mexico: Off Arrowsmith Bank, Yucatan; lat. 20°59′30″ N., long. 86°13′45″ W.; 130 fathoms; Co.; January 22, 1885; station 2354, *Albatross;* 1 female (9547).

Greater Antilles: Off Mona Island, Mona Passage; lat. 18°03′45″ N., long. 67°48′10″ W.; 240–300 fathoms; February 11, 1933; station 43, Johnson-Smithsonian Expedition; 1 female, ovigerous (68165).

Leeward Islands: Off Guadeloupe; 150 fathoms; temperature 59¾° F.; 1878–79; station 166, *Blake;* 1 ovigerous female, holotype (M. C. Z. no. 6509).

Windward Islands: Off St. Vincent; 88 fathoms; temperature 62° F.; 1878–79; station 232, *Blake;* 1 carapace, paratype (M. C. Z. no. 2641).

Family HOMOLODROMIIDAE Alcock

Homolodromidae Alcock, Journ. Asiat. Soc. Bengal, vol. 68, pt. 2, no. 3, p. 127, 1899.

Carapace longer than broad, convex in both directions, the true cervical and the branchial grooves present. Front cut into two prominent teeth, between which, but on a much lower plane, a third

small tooth is sometimes present. Antennal flagella longer than carapace. External maxillipeds with a marked pediform cast. Chelipeds equal, slender, though stouter than legs. First two pairs of legs much longer than the chelipeds; last two pairs much shorter than the first two pairs, subdorsal, prehensile. Abdomen in both sexes consists of seven separate segments; no lateral platelets intercalated between the sixth and seventh segments. Gills trichobranchiae or intermediate between trichobranchiae and phyllobranchiae; gill-plumes very numerous—there may be as many as 20 on either side. Epipodites on the chelipeds and first two or three pairs of legs. Sternal grooves of female short, ending at level of genital openings. (After Alcock.)

KEY TO THE AMERICAN GENERA OF THE FAMILY HOMOLODROMIIDAE

A[1]. Carapace subquadrate. Antennules not concealed. Ambulatories very long and slender.....**Homolodromia** (p. 58)
A[2]. Carapace ovoid. Antennules folding under rostral teeth. Ambulatories short.....**Dicranodromia** (p. 59)

Genus HOMOLODROMIA A. Milne Edwards

Homolodromia A. Milne Edwards, Bull. Mus. Comp. Zool., vol. 8, p. 32, 1880 (type, *H. paradoxa* A. Milne Edwards).—Bouvier, Bull. Soc. Philom. Paris, ser. 8, vol. 8, p. 37 [4], etc., 1896.—A. Milne Edwards and Bouvier, Mem. Mus. Comp. Zool., vol. 27, p. 9, 1902.

Carapace narrow, wider behind than in front. The antennules are too large to fold into their fossettes. Antennae very mobile, inserted below the ocular peduncle; they are much longer than the carapace. The eyes are very small and have no special orbital cavity. Buccal area quadrilateral; epistome very distinct. Teeth of fingers sharp, fitting together. The first and second ambulatories are slender and very long, the third and fourth pairs are elevated on the dorsum, small and cheliform. Abdomen of male composed of seven segments, which are in contact only in their middle part, their lateral parts narrower and free.

West Indies; east Africa; 356 to 472 fathoms.

HOMOLODROMIA PARADOXA A. Milne Edwards

Plate 13, Figures 1, 2; Plate 14, Figures 1–4

Homolodromia paradoxa A. Milne Edwards, Bull. Mus. Comp. Zool., vol. 8, p. 33, 1880 (type locality, off Nevis, 356 fathoms; type in M. C. Z.); Recueil de figures de Crustacés nouveaux ou peu connus, pl. 6, figs. 2–2e, 1883.—Bouvier, Bull. Soc. Philom. Paris, ser. 8, vol. 8, p. 38, etc., figs. 1, 2, 3, 32, 1896.—A. Milne Edwards and Bouvier, Mem. Mus. Comp. Zool., vol. 27, p. 11, figs. 1, 2, pl. 1, 1902.

Diagnosis.—Eyes small, without special orbital cavity. Last two pairs of legs with cheliform extremities.

Description.—Carapace thick, much swollen transversely, and bent down anteriorly; clothed with a scattered down which does not conceal the test; surface smooth, punctate behind. Posterior branchial regions dilated, their anterior limit a deep branchial furrow which is interrupted a little before reaching middle of cardiac area; this last is strongly marked except behind where its periphery is marked by wide, shallow depressions. The cervical suture is represented in its median part by a shallow median arc, concave forward, which does not join the lateral parts. Front armed with two strong, triangular, flat rostral horns, which reach to the level of the extremity of the second article of the antennae and are deeply separated by a furrow continued on the gastric region. A large postorbital spine is conical and directed outward and a little forward. Lateral borders unarmed and almost parallel. Latero-inferior regions unarmed.

Ocular peduncles nearly as long as rostral horns and almost cylindrical; armed in front with a small spine and terminating in a cornea very little dilated and with a deep sinus behind. The antennular peduncles reach almost to the end of the antennal peduncles. Chelipeds of male feeble, equal, covered with smooth scattered hairs; a spine on upper distal border of merus and another outside overlapping carpus; prehensile margins of digits dentate, the immobile finger ending in a sort of fork which fits the tip of the mobile finger. The first two ambulatories are smooth, cylindrical; dactylus very long and strongly curved; merus armed with a small spine above at distal end. The chela of the last two pairs of feet is formed by a very curved dactyl opposed to a short projection of the propodus, armed with several spines.

Measurements.—Male holotype, total length of carapace 18, width at base of anterolateral spines 9, maximum width of posterior branchial regions 12.5 mm.

Range.—Leeward Islands, Caribbean Sea.

Material examined.—Off Nevis; 356 fathoms; station 151, *Blake;* 1878–79; 1 male holotype (M. C. Z. no. 6512).

Genus DICRANODROMIA A. Milne Edwards

Dicranodromia A. Milne Edwards, Bull. Mus. Comp. Zool., vol. 8, p. 31, 1880 (type, *D. ovata* A. Milne Edwards).—Filhol, La vie au fond des mers, p. 127, 1885.—Ortmann, Zool. Jahrb., vol. 6, p. 549, 1892.—Bouvier, Bull. Soc. Philom. Paris, ser. 8, vol. 8, p. 48, etc., 1896.—A. Milne Edwards and Bouvier, Mem. Mus. Comp. Zool., vol. 27, p. 14, 1902.

Arachnodromia Alcock, Deep-sea Brachyura, *Investigator*, p. 17, 1899 (type, *A. baffini* Alcock and Anderson).

Carapace narrow, ovoid, elongate, scantily hairy. The antennules fold longitudinally under the broad rostral teeth and the eyes are concealed in the deep orbital cavity. A strong crest on either side of endostome; epistome triangular, the point joining the front. The

facial region occupies nearly the width of carapace. The sutures of the sternal plastron of the female are lightly marked and do not overreach the line of the third pair of feet. Ambulatories slender, shorter than in *Homolodromia;* last two pairs with subcheliform extremity, the propodite not forming a distinct digit. Epimera of segments of female abdomen in contact; terminal segment of enormous size.

Caribbean Sea; east Atlantic; Indian Ocean; Japan; 150 to 651 fathoms.

DICRANODROMIA OVATA A. Milne Edwards

FIGURE 15; PLATE 13, FIGURES 3, 4

Dicranodromia ovata A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 32, 1880 (type locality, Barbados, 180 fathoms; type, M. C. Z. no. 6510).—A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 27, p. 15, figs. 5, 6; pl. 2; pl. 3, fig. 1–4, 1902.

Diagnosis.—Eyes large and deep in orbital cavity. Last two pairs of legs subcheliform, the propodite not forming a distinct digit.

Description.—Carapace and appendages covered with very short blunt spinules; ventral surface and legs hairy, especially the margins,

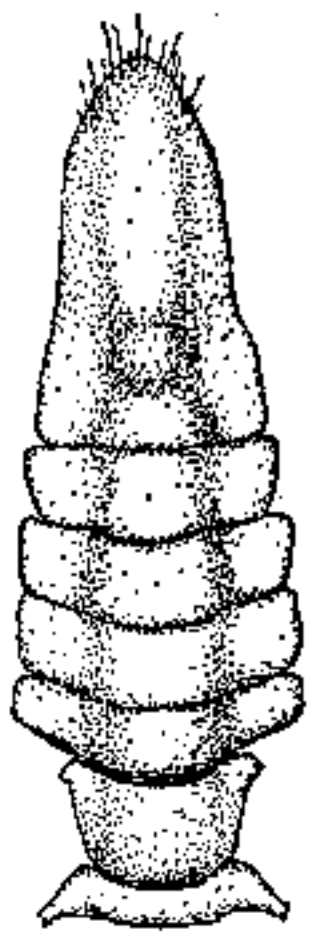


FIGURE 15.—*Dicranodromia ovata*, male (68887): Abdomen, enlarged.

which are clothed in long fine hairs. Carapace more convex transversely than from front to rear; side margins nearly parallel; they diverge slightly behind, the carapace being wider in its posterior than anterior part. Front formed of two large triangular teeth between which there is a small median point, a vertical prolongation from the epistome. Upper orbital border interrupted toward the outside by a narrow fissure; a wide V-sinus outside the orbit and below the antero-lateral angle; suborbital border lobiform; some very small spines on the orbital lobes and the anterior part of the lateral borders of the carapace. The ocular peduncles turn laterally in orbital cavity; they

narrow gradually from base to the rather reduced cornea; basal article of peduncles mobile and very distinct. The basal article of the antennular peduncle enlarges from base to extremity; it is flattened on ventral side; the next article turns almost transversely outward under the concave surface of the rostral horn; between this article and the horn is folded the following article, and the flagellum recurves outward above the last named; there is, therefore, a perfectly formed antennular cavity comprised between the vertical partition of the front, the rostral horn, the basal article of the ocular peduncle and the antennal peduncle. The antennal flagellum nearly reaches the extremity of the chelipeds. Buccal cavity quadrangular, narrowing behind.

Chelipeds slightly unequal; merus 3-sided; a shallow arched sinus on outer surface of carpus. Fingers spooned, white and naked except at the base; the dactylus is bent downward and slightly inward from the palm; it has a tooth at base of outer prehensile edge, and a small tooth on either side of the pointed tip which fits into the notch of the immobile finger; this last has, beside its two terminal teeth, four more on the outer edge. The next two pairs of feet do not overreach the chelipeds; the last two pairs are scarcely chelate, the strongly arched dactylus in the midst of a crown of spines bordering the extremity of the propodus. The terminal segment of the abdomen is nearly as long as the sum of the remaining segments; in the male it is narrower than segments 3–6 and is much longer than broad; in the female it is somewhat heart-shaped and broader than long.

Measurements.—Type female, total length of carapace 26, greatest width 19 mm (after Milne Edwards and Bouvier). Ovigerous female (57069), total length of carapace 9.8, greatest width 8 mm.

Range.—From Straits of Florida to Barbados; 70 to 229 fathoms.

Material examined.—See table 16, page 64.

Superfamily THELXIOPEIDEA, new name

Homoliens (part), MILNE EDWARDS, Histoire naturelle des Crustacés, vol. 2, p. 180, 1837.

Homolidea ALCOCK, Journ. Asiat. Soc. Bengal, vol. 68, p. 126, 1899.

Carapace longer than broad; *línea anomurica*, or suture line, running on either side from posterior border of carapace to inner side of antennal spine, usually present. Eyes not retractile into orbits, nor antennules into pits. Basal article of antennules subglobular. The eyestalks consist of two movable joints, a slender conspicuous basal joint and a stout terminal joint that carries the eye. Antennal flagella, except in Latreilliidae, much longer than carapace. Interantennular septum a distinct vertical process. The front forms a slender triangular prominent rostrum which may be bifid at tip, and often has a spine on either side at base. Division between epistome

and palate distinct, vault of palate shallow. External maxillipeds pediform or suboperculiform. Chelipeds and legs long and slender. Only the last pair of legs is dorsal and reduced in size. Sternum of female broad. Abdomen of male and usually of female, consists of seven separate segments. Gills phyllobranchiate; gill-plumes vary from 14 to 8 on either side. (After Alcock.)

KEY TO THE FAMILIES OF THE THELXIOPEIDEA

A¹. Gills 13 or 14 on each side. Mastigobranchs on first one or three pairs of legs. First article of eyestalks not much longer than second.....**Thelxiopeidae** (p. 62)

A². Gills 8 on each side. Mastigobranchs not found on any legs. First article of eyestalks much longer than second....**Latreilliidae** (p. 63)

Family THELXIOPEIDAE, new name

Homolidae HENDERSON, Voyage of H. M. S. *Challenger*, vol. 27, Anomura, p. 18, 1888.—ORTMANN *in* Bronn's Klassen und Ordnungen des Thier-Reichs, vol. 5, pt. 2, Arthropoda, p. 1155, 1901.

Carapace elongate-quadrangular, ovoid or urn-shaped. Terminal joint of eyestalk, including eye, either longer or shorter than the slender basal joint. Antennal flagella much longer than carapace. External maxillipeds pediform or subpediform.

KEY TO THE AMERICAN GENERA OF THE FAMILY THELXIOPEIDAE

A¹. Carapace broadest anteriorly. Second article of antennal peduncle with antero-external spine.....**Thelxiope** (p. 62)

A². Carapace broadest posteriorly. Second article of antennal peduncle without antero-external spine.

B¹. Carapace with dorsolateral margins. Rostrum short...**Paromola** (p. 68)

B². Carapace without dorsolateral margins. Rostrum elongate.....**Homologenus** (p. 70)

Genus THELXIOPE Rafinesque

Hippocarcinus ALDROVANDI, De mollibus, crustaceis, testaceis et zoophytis, p. 178, 1606 (type, *H. hispidus* Aldrovandi).

Thelxiope RAFINESQUE, Précis des découvertes et travaux somiologiques, p. 21, 1814 (type, *T. palpigera* Rafinesque).

Homola LEACH, Trans. Linn. Soc. London, vol. 11, p. 324, 1815 (type, *H. spinifrons* Lamarck); Zoological miscellany, vol. 2, p. 82, 1815.—ALCOCK, Journ. Asiat. Soc. Bengal, vol. 68, p. 154 and synonymy, 1899.

Homolus LEACH, *in* Dict. Sci. Nat., vol. 21, p. 416, 1821. Leach here recognizes that Rafinesque and Latreille had described the same genus under the names *Thelaiope* [*Thelxiope*] and *Hippocarcin.* [*Hippocarcinus*], respectively.

Carapace square-cut, longer than broad, broadest in front, and with deep vertical sides; gastric region well demarcated and occupying the anterior half of carapace, *linea anomurica* distinct and dorsal. Front narrow, forming a rostrum, either entire or bifid at tip, and with a spine on either side of its base. Orbits quite incomplete, not concealing eyestalks, and the eyes, which project far outside them,

are retractile against sides of carapace. Eyestalks long, composed of two joints, a slender basal joint, and a swollen terminal joint that carries the eye; terminal joint nearly as long as basal. Second article of antennal peduncle having its antero-external angle produced in a spine. Palate distinctly delimited from epistome everywhere except in middle line; expiratory canals well defined. External maxillipeds subpediform. Chelipeds rather slender and generally somewhat spiny. Legs long, more or less compressed and spiny, the last pair reaching to end of carpus of preceding pair, and subcheliform, the propodite dilated near the basal end and never twice length of dactylus. Abdomen of both sexes rather broad, consisting of seven separate segments. Gill plumes 14 on either side; epipodites on chelipeds and first two pairs of legs.

East and west coasts of America; eastern North Atlantic and Mediterranean; Indo-Pacific.

The substitution of *Thelxiope* for *Homola* is called for under the International Rules of Zoological Nomenclature. *Thelxiope* precedes *Homola* by a year. Rafinesque's definition is above question. His description of the type species also certainly applies to the *barbata* of Fabricius. The name *Thelxiope* has been mentioned by Desmarest,[10] Roux,[11] Cuvier,[12] White,[13] and Stebbing [14] as synonymous, or probably synonymous, with *Homola*, but so far no one has used the weapon of priority to do justice to Rafinesque's genus.

KEY TO THE AMERICAN SPECIES OF THE GENUS THELXIOPE

A[1]. Rostrum bidentate.....**barbata** (p. 63)
A[2]. Rostrum a single spine.....**vigil** (p. 66)

THELXIOPE BARBATA (Fabricius)

FIGURE 16; PLATE 15, FIGURES 1, 2

Cancer barbatus FABRICIUS, Entomologia systematica, vol. 2, p. 460, 1793 (type locality, Bay of Naples; type not located).—HERBST, Versuch einer Naturgeschichte der Krabben und Krebse, vol. 2, p. 166, pl. 42, fig. 3 (col.), 1796.

Thelxiope palpigera RAFINESQUE, Précis des découvertes et travaux somiologiques, p. 21, 1814.

Doripe spinifrons LAMARCK, Histoire naturelle des animaux sans vertèbres, vol. 5, p. 245, 1818 (type locality, Mediterranean; type in Paris Mus.). Synonym, *D. fronticornis* Lamarck, MS.

Homola spinifrons LEACH, Trans. Linn. Soc. London, vol. 11, p. 324, 1815, (type locality not given); Zoological miscellany, vol. 2, p. 82, pl. 88, 1815.—DESMAREST, Considérations générales sur la classe des Crustacés, p. 134, pl. 17, fig. 1, 1825.—MILNE EDWARDS, Histoire naturelle des Crustacés, vol. 2, p. 183, pl. 2, fig. 1–4, 1837; *in* Cuvier, Règne animal, Crustacea (Disciples' ed.), p. 102, pl. 39, fig. 2 (col.)–2b, 1837.

[10] Desmarest, Considérations générales sur la classe des Crustacés, p. 134, 1825.
[11] Roux, Crustacés de la Méditerranée et de son littoral, p. 85, 1828.
[12] Cuvier, Le règne animal, ed. 2, vol. 4, p. 68, 1829.
[13] White, List of the specimens of Crustacea in the collection of the British Museum, p. 55, 1847.
[14] Stebbing, South African Crustacea, pt. 2, p. 22, 1902.

TABLE 16.—*Material examined of* Dicranodromia ovata

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
FLORIDA:	° ′ ″	° ′ ″									
Off Key West	24 15 00	82 13 00	152-229			1877-78	5	*Blake*	1♀ sm.	6511, M.C.Z.	Figured paratype.
Do	Sand Key Light bearing NNW.		About 100.			June 20, 1893	30	State Univ. Iowa Bahama Exped.	1♀ ovig.	S. U. I.	
Do	Sand Key Light bearing NNW about 5 miles.		About 90.			June 21, 1893	35	do	1♀ 2♀	57068 S. U. I.	
Off American Shoal	Light bearing N. by W. 10 mi.		About 100.			June 27, 1893	51	do	2♀ (1 ovig.)	S. U. I.	
Do	Light N. by W. ½ W. about 10 mi.		105-110			do	52	do	1♀ ovig.	57069	
Do	Light NE. by N. 8 mi.		70-80			June 29, 1893	62	do	1♀	57070	
Do	*Light N. by E. ½ E.* about 8 mi.		*85-95*			*do*	*63*	*do*	*1♂*	*S. U. I.*	*Under simple ascidian.*
Do	Light N. by W. about 8 mi.		About 110.			do	64	do	1♀ ovig.	S. U. I.	
CUBA: Off Habana			175					*Blake*	1♀	Paris Mus.	Paratype. Not seen by present author.
LESSER ANTILLES:											
Guadeloupe			150			1878-79	166	do	1	2745, M. C. Z.	Paratype.
Barbados			180			do	295	do	1♀ ovig.	6510, M. C. Z.	Type, figured.

Homola barbata WHITE, List of the specimens of Crustacea in the collection of the British Museum, p. 55, 1847.—S. I. SMITH, Proc. U. S. Nat. Mus., vol. 3, p. 420, 1880; Rept. U. S. Fish Comm. for 1885, p. 637 [33], pl. 2, fig. 1, 1886.—STEBBING, South African Crustacea, pt. 2, p. 22 and synonymy, 1902.—HAY and SHORE, Bull. U. S. Bur. Fisheries, vol. 35 (1915–1916), p. 419, pl. 30, fig. 10, 1918.

Diagnosis.—Carapace widest in anterior half. Rostrum bidentate. Orbital spine distant from spine at base of rostrum. A tooth on second segment of abdomen.

Description.—Rostrum small, bidentate; upper orbital teeth larger than those situated on either side of the base of rostrum and placed

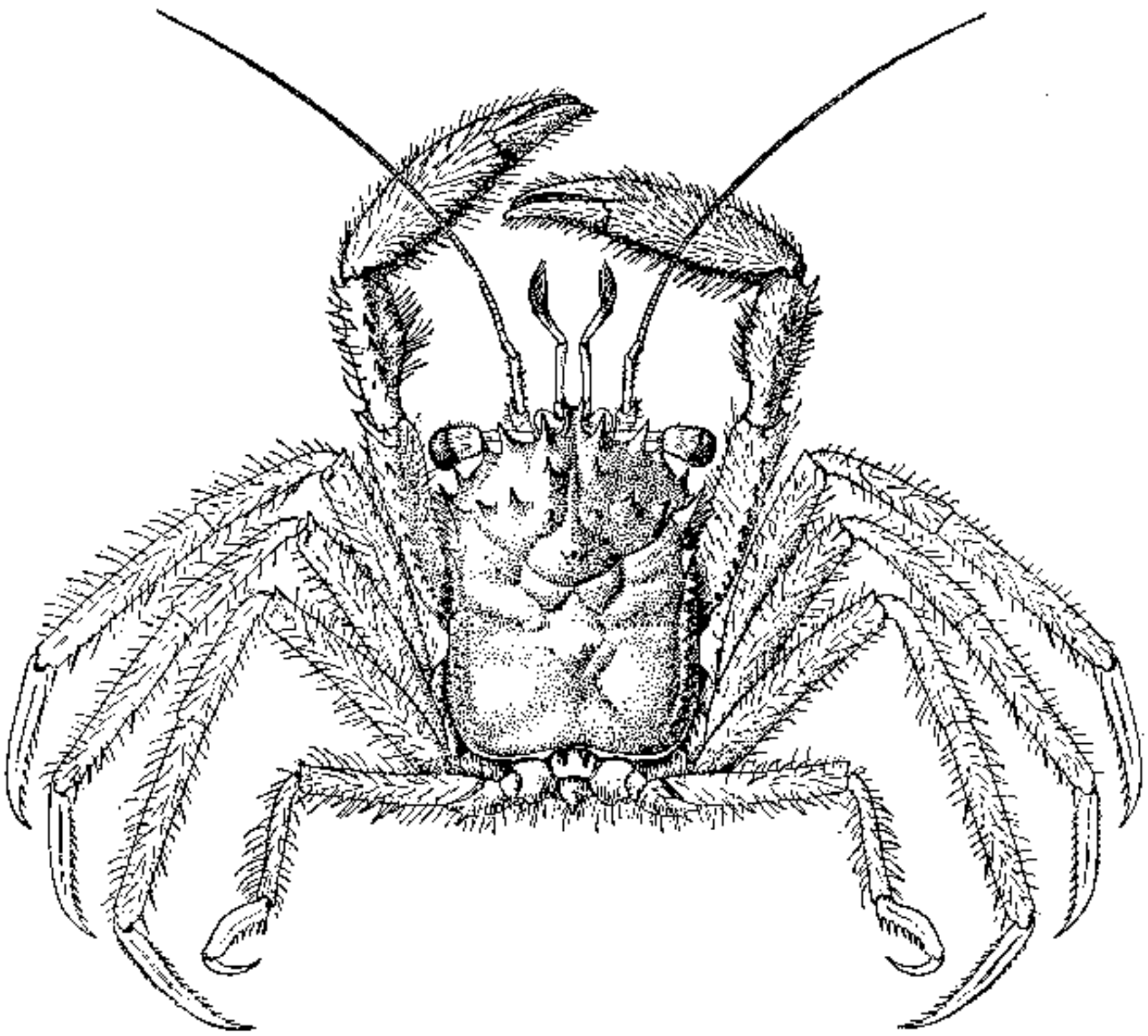


FIGURE 16.—*Thelxiope barbata*, male (19290). After Smith.

on the same line. Gastric region rough with nine large spines, of which one is median and posterior, four middle disposed in a square, and two lateral on each side opposite middle of square and in nearly a transverse line; lateral margins of carapace armed anteriorly with a very large spine, situated at extremity of the suture which separates the gastric and hepatic regions; a second spine shorter and slenderer, a little farther back, followed by a series of small spinules; no spines on rest of carapace. Arm prismatic, a row of spines on each margin; hands a little compressed, spinous on lower border only. Ambulatory legs compressed; first three armed below with one row of small

spines on propodus and dactyl and above with a row of rather strong spines on merus; fourth or dorsal leg with a row of large spines on lower edge of merus, propodus and dactyl. A large median conical tooth on second segment of abdomen.

Color.—Body covered with tawny or yellowish-brown or reddish-brown hair; spines red or partly red. Herbst (*loc. cit.*) shows a flowery red patch on hinder half of carapace.

Measurements.—Male (23182), length including rostrum 29.5, anterior width of dorsum at base of spines, 22.4, posterior width of dorsum 16 mm. Female (23182) length 33.2, anterior width 25.2, posterior width 19.7 mm.

Range.—Off southeastern Massachusetts to Caribbean Sea; eastern Atlantic from Portugal and Azores to Madeira Islands; Mediterranean; South Africa; 30 to 373 fathoms.

Material examined.—See table 17, page 67.

THELXIOPE VIGIL (A. Milne Edwards)

PLATE 16, FIGURES 1–3

Homola vigil A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 33, 1880.—A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 27, p. 27, fig. 9, pl. 3, figs. 16–18; pl. 4, figs. 5–9; pl. 5, figs. 1–10, 1902 (type locality, off Martinique, 169 fathoms; type not found in M. C. Z.).

Diagnosis.—Carapace nearly as broad as long, spines included. Rostrum a single spine. Ocular peduncles much swollen in corneal region.

Description.—Compared to *T. barbata,* carapace shorter and wider, spines of anterior part more feeble, rostral spine acute. Carapace a little swollen; sides parallel up to the shoulder spine; median gastric spine on the narrow part of the mesogastric; a small spine on anterior branchial area; marginal spinules of posterior branchial area few and indistinct. Eyes stouter in terminal portion. Second article of antennal peduncle without a prominence. Epistome with a longitudinal crest; border of epistome very distinct especially at middle where there is a shallow sinus; a strong transverse crest on sternum.

Chelipeds a little narrower than in *T. barbata;* ambulatory legs longer and narrower, the meral spines better developed; long hairs scarce; dactyl of posterior pair almost lanceolate, penult article longer than in *barbata.*

Measurements (after Milne Edwards and Bouvier).—Male, holotype, length of carapace to base of rostrum 19, width to base of anterolateral spines 18, width near middle of posterior branchial area 18 mm.

Range.—From the coast of Georgia to the Windward Islands; 169 to 440 fathoms.

Material examined.—See table 18, page 72.

TABLE 17.—*Material examined of* Thelxiope barbata

Locality	Bearings: Latitude N.			Bearings: Longitude W.			Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	°	′	″	°	′	″			°F.						
MASSACHUSETTS:															
Off Marthas Vineyard	40	05	39	70	23	52	86	S. G. Sh. Sponges	50.5	Sept. 4, 1880	872	*Fish Hawk*	2 ♂	A. M. Norman	
Do	40	03	00	70	31	00	100	yl. M	52	Aug. 23, 1880	949	do	1 ♀ 1 y	7301	
Do	39	59	15	70	36	30	143	yl. S	48	Sept 20, 1883	2088	*Albatross*	1 fragmentary	5371	Soft shell.
Do	39	56	30	69	43	20	84	S. brk. Sh	52.3	Aug. 6, 1884	2197	do	1 ♂ sm	8045	
Do	39	54	00	69	51	30	134	brd. S. Sponges	53	Aug. 4, 1881	940	*Fish Hawk*	1 ♂	19290	
													2 ♂ 1 ♀	Yale Mus.	
DELAWARE:															
Off Delaware Bay	38	30	00	73	11	00	130	S	49	Oct. 10, 1881	1043	do	1 ♀ sm	7303	
Do	38	33	00	73	18	00	104	S	51	do	1046	do	2 ♂ 2 ♀ (1 ovig.)	4988	
VIRGINIA:															
Off Chincoteague Island.	37	55	00	74	05	00	65, 62			Aug. 12, 1916	10382	*Grampus*	Fragments of 1	87455	
E. of Northampton County.	37	26	00	74	19	00	56	S. Sh	55	Nov. 16, 1880	896	*Fish Hawk*	1 ♀	5774	
Do	37	22	00	74	29	00	57.5	S	54	do	899	do	1 ♂ sm	7302	
Off mouth of Chesapeake Bay.	37	08	30	74	33	30	85	crs. gy. S. bk. Sp. brk. Sh.	52.5	June 3, 1885	2422	*Albatross*	1	21715	
Do	37	07	40	74	35	40	70	gn. M. G	57.9	Oct. 18, 1884	2265	do	1 ♂	8770	
E. of Virginia Beach	36	41	05	74	38	55	373	gn. M. fnc. S		May 1, 1883	2014	do	2 ♂	5593	
EASTERN COAST UNITED STATES.										1884		do	1 ♂	9103	
FLORIDA:															
Off Fernandina	30	47	30	79	49	00	270	gy. S	48.3	May 5, 1886	2666	do	1 ♂ y	11410	
Off Key West	24	25	30	81	47	45	50		74	Jan. 15, 1885	2316	*Albatross*	1 ♂ y	21713	
S. of Loggerhead Key, Tortugas.	No. 2 red buoy.						40			Aug. 4, 1931		Longley and Manter.	1 ♂	71363	Gift of Carnegie Institution.
S. of Apalachicola Bay.	28	45	00	85	02	00	30	gy. S. brk. Co		Mar. 15, 1885	2405	*Albatross*	1 ♀ y	21711	
MEXICO: Off Arrowsmith Bank, Yucatan.	20	59	30	86	23	45	130	Co		Jan. 22, 1885	2354	do	2 ♂	21714	
ITALY: Near Naples													1 ♂ 1 ♀	23182	From Zool. Station, Naples.

Genus PAROMOLA Wood-Mason

Paromola WOOD-MASON, Ann. Mag. Nat. Hist., ser. 6, vol. 7, p. 267, 1891 [type, *P. cuvieri* (Risso)].—ALCOCK, Journ. Asiat. Soc. Bengal, vol. 68, p. 156, 1899.—IHLE, Die Decapoda Brachyura der *Siboga*-Expedition, monogr. 39b, p. 69, 1913.

Differs from *Thelxiope* in its greatest breadth behind; the *linea anomurica* very conspicuous and well inside the lateral border; rostrum a simple cylindrical spine flanked on either side at base by a single spine of equal or greater size; second article of antennal peduncle not produced or specially acute at antero-external angle.

Mediterranean Sea; Indian Ocean; Pacific coast of America.

KEY TO THE AMERICAN SPECIES OF THE GENUS PAROMOLA

A¹. Terminal joint of eyestalk swollen at extremity.....**faxoni** (p. 68)
A². Terminal joint of eyestalk diminishing toward extremity..**rathbuni** (p. 69)

PAROMOLA FAXONI (Schmitt)

PLATE 18; PLATE 19, FIGURE 1

Homola faxoni SCHMITT, Univ. California Publ. Zool., vol. 23, p. 184, pl. 31, fig. 7, 1921 (type locality, off Point Loma, Calif.; type, U.S.N.M. no. 53331).

Diagnosis.—Terminal joint of eyestalk swollen at extremity. Chelipeds of male slender. Chelipeds and legs not rough on the sides. Orbital spine at base of rostrum.

Description.—Carapace, exclusive of rostral spine, a little longer than broad, greatest width at about posterior fourth; entire surface more or less obscured by a thick short pubescence. The supraorbital spines, one on either side of base of rostrum, are stout, surpassing the rostrum somewhat in size and length; each is provided on its posterior margin with two small hooked spines. Behind and a little closer together than the supraorbital spines there are two much less prominent ones on the anterior part of gastric region. External to each of these three is a spine of like size, about in line with the tubercle on the apex of the gastric cavity and the superior hepatic spine at anterolateral angle of carapace; a tubercle also between the median gastric tubercle and the outermost of the anterior gastric spines, one on each side. Hepatic region well developed; below the stout spine at anterolateral angle of carapace there is a smaller, inferior hepatic spine. Marking the lateral margin of the dorsal surface of the carapace behind the superior hepatic spine there is a row of four slightly smaller spines on the branchial region, paralleling the *linea anomurica*, and decreasing in size from before backward. There are sundry other tubercles rather regularly arranged in more or less definite groups on the various regions of the carapace.

Hairs covering chelipeds and legs longer than those of carapace; a row of sharp, hooked spines on upper margin of merus of all except

the last pair of legs, the largest of the series overhanging the articulation with the carpus at the superior distal angle; a spine, similarly placed, occurs on the merus of the last pair of legs; fingers of cheliped one-third the entire length of chela, and dark colored. Abdomen thickly pubescent; two basal segments each armed with a sharp median tubercle. (After Schmitt.)

Measurements.—Female holotype (53331), length of carapace including rostrum 45, of rostrum 5, greatest width of carapace 36, length of last leg to distal extremity of propodus 66, of next preceding leg to distal extremity of merus 47 mm.

Range.—Off Point Loma, Calif.; 67 to 135 fathoms.

Material examined.—See table 19, page 72.

PAROMOLA RATHBUNI Porter

PLATE 19, FIGURE 2

Paromola rathbuni PORTER, Rev. Chil. Hist. Nat., vol. 12, p. 88, pl. 8, 1908 [type locality, Isla de Mas-Afuera, Juan Fernandez; type (♀) destroyed by fire in 1906]; vol. 31, p. 141, pl. 10 (♂), 1927.—RATHBUN, Proc. U. S. Nat. Mus., vol. 38, p. 594, 1910.

Diagnosis.—Terminal joint of eyestalk diminishing toward extremity. Chelipeds of male stout. Chelipeds and legs very rough on the sides.

Description.—Carapace, chelipeds, and legs rough above, covered with sharp granules and tubercles. Palms covered with hair. Rostrum seen from above, a short equilateral triangle, the sides slightly concave. Orbital spines narrower than rostrum. Hepatic spine large, directed obliquely forward and with a long slender tip; behind it, a sharp outward-pointing tooth. Four spines in a transverse row on anterior gastric region. Lateral branchial spines numerous, small, unequal. Terminal article of eye about as long as peduncle, and subcylindrical, a little wider at proximal than at distal end. Second article of antennal peduncle with a spine at distal inner angle. Chelipeds of male strong, twice as long as carapace; palms one and a half times as long as fingers; merus joints margined with numerous spines. Merus of second ambulatory six times as long as wide; merus of fourth leg three-fifths as long as third. A tooth on first segment of abdomen.

Color.—Uniform dark olive above; clear yellow below except the buccal parts, which are speckled with olive. (Porter.)

Measurements.—Length of carapace of type female 90.5 mm. Length of carapace of male 109 mm.

Material.—Only two specimens are on record: The type female was destroyed by fire; later a male was collected by Prof. don Conrado Ruiz S., and it is now in the National Museum of Santiago, Chile. Both were taken at Isla de Mas-Afuera, Juan Fernandez.

Genus HOMOLOGENUS A. Milne Edwards

Homolopsis A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 34, 1880, (type, *H. rostratus* A. Milne Edwards). Not *Homolopsis* Bell, Monograph of the fossil malacostracous Crustacea of Great Britain, pt. 2, p. 22, 1862 (1863).

Homologenus A. MILNE EDWARDS, *in* Henderson, Voyage of H. M. S. *Challenger*, Anomura, vol. 27, p. 20, 1888.—BOUVIER, Bull. Soc. Philom. Paris, ser. 8, vol. 8, p. 30, 1896.—A. MILNE EDWARDS and BOUVIER, Crustacés décapodes provenant des campagnes du yacht l'*Hirondelle* (supplément) et de la *Princesse-Alice*, fasc. 13, p. 13, 1899; Mem. Mus. Comp. Zool., vol. 27, p. 29, 1902.

Differs from *Thelxiope* in its much longer rostrum, almost styliform, and armed near the middle of its length with a pair of symmetrical spines, by the reduction of the anterolateral spine, the great development of the marginal spine which limits outwardly the antennal region, the presence of a strong metagastric spine; and by the regular convexity of the carapace which is dilated behind and presents no trace of dorsolateral margins; epistome narrow, scarcely soldered with the front.

Eastern Atlantic (off Morocco and Azores); western Atlantic (Bahamas and West Indies); 580 to 1,039 fathoms.

HOMOLOGENUS ROSTRATUS (A. Milne Edwards)

FIGURE 17; PLATE 17, FIGURES 1–3

Homolopsis rostratus A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 34, 1880 (type locality, between St. Thomas and Santa Cruz, 580 fathoms; whereabouts of type unknown); Recueil de figures de Crustacés nouveaux ou peu connus, pl. 6, fig. 1, 1a, 1883.

Homologenus rostratus BOUVIER, Bull. Soc. Philom. Paris, ser. 8, vol. 8, p. 30, fig. 25, 1896.—A. MILNE EDWARDS and BOUVIER, Expéditions scientifiques du *Travailleur* et du *Talisman*, pt. 1, Crustacés décapodes, 1880 1883, p. 11, pl. 1, fig. 1 (col.), pl. 8, figs. 19 21, 1900; Mem. Mus. Comp. Zool., vol. 27, p. 30, 1902.

Homologenus (*Homolopsis*) *rostratus* A. MILNE EDWARDS and BOUVIER, Crustacés décapodes provenant des campagnes du yacht l'*Hirondelle* (supplément) et de la *Princesse-Alice*, fasc. 13, p. 13, 1899.

Diagnosis.—Rostrum with a pair of spines midway of its length. Hepatic spine much the longest. Eyestalks short. Legs filiform.

Description.—Carapace ovoid, strongly narrowed in front, ending in a sharp rostrum, directed forward and downward and surmounted laterally by two strong spines; its tip reaches the flagellum of outer antennae. At base of rostrum are two large supra-orbital spines directed upward and outward. A very long spine, having the same direction as the preceding, arms the hepatic region; behind this the branchial lobe bears a very small spine, as does also the metagastric lobe. The anterolateral spine is behind and longer than the antennal

spine. A small protogastric spine. The carapace is convex transversely and has no dorsolateral margin; it is covered with fine subacute granules, and on its anterior half with straight hairs some of which are long and recurved. There is no trace of an orbital cavity, the vertical region in its place extending from the basal rostral spine to the antennal spine. Ocular peduncles stout, constricted at middle; cornea occupying nearly one-third of its length. Basal article of antennular peduncle dilated at proximal end, two next articles slender, subequal, the base of the last one not reaching extremity of rostrum; the longer flagellum is nearly as long as the last article of the peduncle. The antennal flagellum is a little longer than carapace.

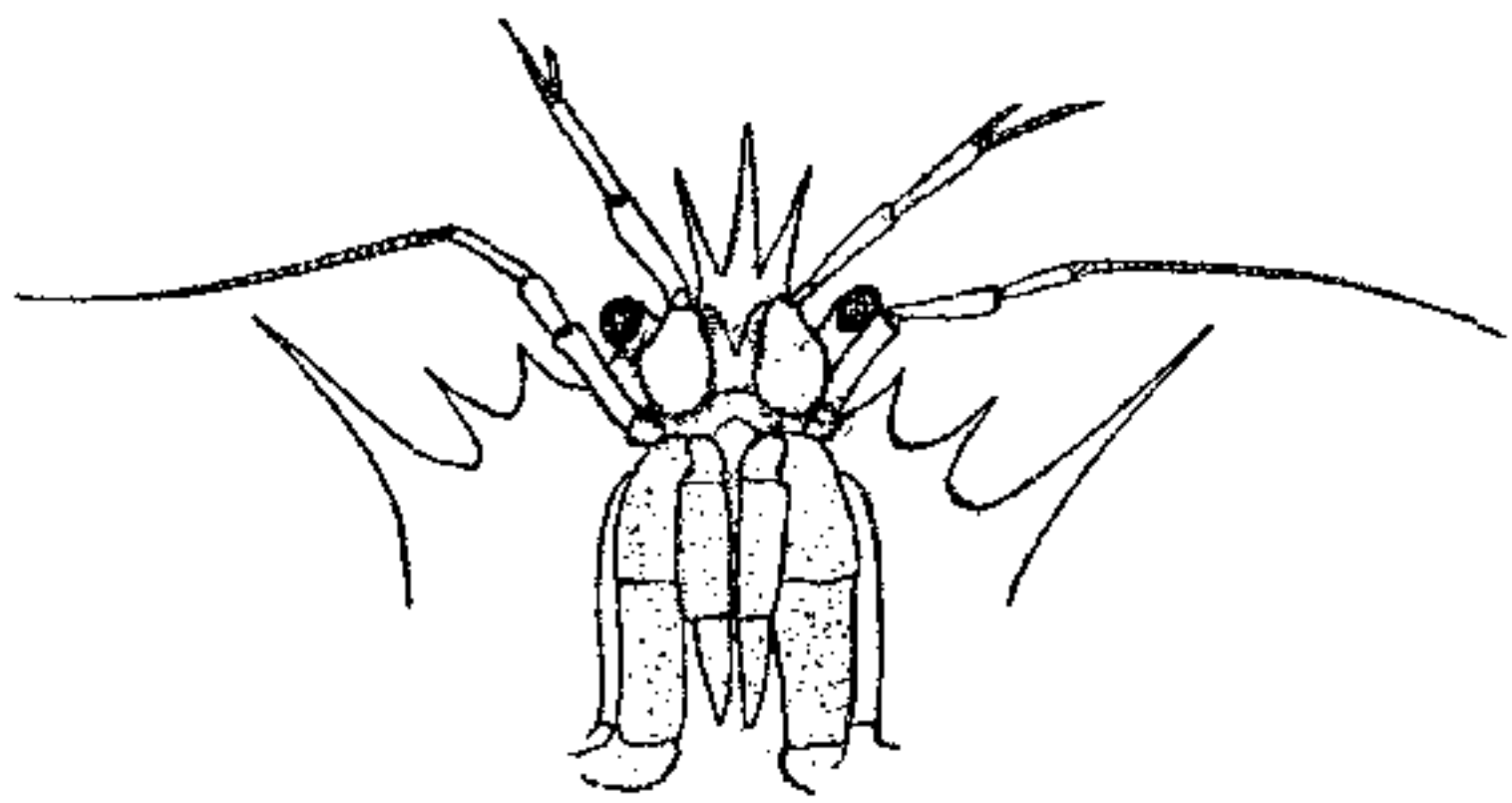


FIGURE 17.—*Homologenus rostratus:* Ventral view of anterior portion, enlarged. After A. Milne Edwards.

Chelipeds of moderate size, not longer than carapace, spinous and finely hairy; propodus armed with six or seven spines below, fewer above; carpus 8-spined; fingers deflexed, unarmed, occludent margins in contact. First three pairs of ambulatories very long, extremely slender and almost cylindrical; merus with a few spines above, including a terminal one, and some shorter spines below. Fourth pair slenderer and much shorter; its propodus has, not far from its base, a long spine directed distad within which the dactyl plays. Male abdomen oval; in male and female a strong spine on second and third segments; a pair of small, lateral spines on segments 3, 4, and 5 in male.

Color.—Vinaceous-pink.

Measurements.—Female (11389), length of carapace to tip of rostrum 15.6; width exclusive of spines 10.7, length of second ambulatory 32.6 mm.

Range.—Eastern Atlantic; Bahamas to Leeward Islands; 580 to 683 fathoms.

Material examined.—See table 20, page 72.

TABLE 18.—*Records of* Thelxiope vigil

Locality	Bearing: Latitude N.	Bearing: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″			°F.						
Off GEORGIA	30 44 00	79 26 00	440	Co. crs. S. Sh. For	45.6	Apr. 1, 1885	2415	*Albatross*	1 ♂	21712	
CUBA	Morro Light		250–400			1878–79	100	*Blake*	1 ♀	2841, M. C. Z.	Not examined by the writer.
LESSER ANTILLES:											
Off Guadeloupe			183		55½	do	171	do	1	2787, M. C. Z.	Do.
Off Martinique			169	fne. S. dk. M. Sh	51	do	193	do	1 ♂	Whereabouts unknown.	Holotype. Not examined by the writer.

TABLE 19.—*Material examined of* Paromola faxoni

Locality	Bearings	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
CALIFORNIA:										
Point Loma Light	N. 85° E., 9.8 mi	93	crs. S. Sh. R		Mar. 17, 1904	4374	*Albatross*	1 y.	53333	
Do	N. 41° E., 8.6 mi	67–73	fne. S. Sh. R		Mar. 3, 1904	4309	do	1 ♀	53331	Holotype.
Do	N. 61° E., 8.2 mi	81	crs. gy. S		Mar. 12, 1904	4360	do	1 y.	53332	
Do	N. 56° E., 7.9 mi	135–95	fne. gy. S. R		Mar. 4, 1904	4312	do	1 ♂ 1 ♀	53334	

TABLE 20.—*Records of* Homologenus rostratus

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″			°F.						
BAHAMA ISLANDS: Little Bahama Bank	27 57 30	77 27 30	660	yl. Oz. bk. Sp	39.3	May 2, 1886	2654	*Albatross*	1 ♀	11389	
LESSER ANTILLES:											
Between St. Thomas and St. Croix.			580	fne. wh. Co. S	42.75	1878–79	124	*Blake*	1 ♀	Whereabouts unknown	Holotype. Not examined by writer.
Near Aves Island	15 24 40	63 31 30	683	yl. M. fne. S	39.75	Jan. 27, 1884	2117	*Albatross*	1 ♂	7802	

Family LATREILLIIDAE Alcock

Latreilliidae ALCOCK, Journ. Asiat. Soc. Bengal, vol. 68, p. 130, 1899.

Carapace elongate-quadrangular or pyriform. Basal article of eyestalk very much longer than terminal article. Antennal flagella not so long as carapace. Outer maxillipeds suboperculiform. Gill plumes eight on either side; no epipodites to chelipeds or legs.

Genus LATREILLIA Roux

Latreillia ROUX, Crustacés de la Méditerranée et de son littoral, p. (1), 1828 (type, *L. elegans* Roux).—ALCOCK, Catalogue of the Indian decapod Crustacea in the collection of the Indian Museum, pt. 1, fasc. 1, p. 70, 1901.

Proctor GISTEL, Naturgeschichte des Thierreichs, p. IX, 1848; substituted for *Latreillia* because named for a man.

Carapace elongate-pyriform, not covering basal articles of legs, its anterior part prolonged to form a subcylindrical "neck" at the end of which are the spiniform rostrum (lying deflexed between two long slender divergent "supra-ocular" spines), the eyes, antennules, and antennae. Regions fairly well indicated; no *linea anomurica*. Eyes large, the slender basal article of the eyestalk being several times longer than the terminal article. Antennules inserted behind the eyes, first article very large, globular and swollen, other articles filiform; antennae behind the antennules, first article small, globular, second and third elongate. Epistome of great length. Buccal cavern well demarcated, efferent branchial channels well defined. Outer maxillipeds not completely closing the buccal orifice; they have a pediform cast, the ischium and merus being rather narrow and the flagellum coarse. Chelipeds long and slender, but much shorter than the first three pairs of ambulatory legs; all the articles are slender except the palm, which in one or both sexes is club-shaped; fingers shorter than palm. First three pairs of ambulatory legs very long and slender; some of their articles are spiny. Last pair of legs more or less reduced in length, subdorsal. Abdomen of male with seven separate segments; of female with segments 4, 5, and 6 fused. (After Alcock.)

Atlantic coast of North America; off Canaries and Azores; Mediterranean Sea; South Africa; Indian Ocean; Japanese Seas; and New South Wales.

LATREILLIA ELEGANS Roux

FIGURE 18; PLATE 20; PLATE 21, FIGURES 1–8

Latreillia elegans ROUX, Crustacés de la Méditerranée et de son littoral, p. (2), pl. 22, 1828 (type locality, Sicily; type in Mus. Hist. Nat. Marseille).—MILNE EDWARDS, Histoire naturelle des Crustacés, vol. 1, p. 277, 1834.—LUCAS, Exploration scientifique de l'Algérie . . . 1840–42, vol. 1, Animaux articulés, p. 3, pl. 1, fig. 1, 1849.—HELLER, Die Crustaceen südlichen Europa, p. 147, pl. 4, fig. 14 (after Lucas), 1863.—SMITH, Proc. U. S. Nat. Mus., vol. 3, p. 419, 1881; Ann. Rept. Comm. Fish and Fisheries for 1882, p. 351, pl. 2, fig. 2, 2a, pl. 3, fig. 1, 1884; for 1885, p. 637 [33], 1886.—BOUVIER, Bull. Soc. Philom. Paris, ser. 8, vol. 8, p. 64 [31], fig. 26, 1896.—ALCOCK, Catalogue of

the Indian decapod Crustacea in the collection of the Indian Museum, fasc. 1, p. 80, 1901.—STEBBING, South African Crustacea, pt. 2, p. 24, 1902 (part; not *L. valida* nor *L. pennifera*).—HAY and SHORE, Bull. U. S. Bur. Fisheries, vol. 35 (1915–16), p. 419, 1918.

Latreillea elegans A. MILNE EDWARDS and BOUVIER, Crustacés décapodes provenant des campagnes du yacht l'*Hirondelle*, fasc. 7, p. 59, pl. 6, figs. 13–15, 1894; Crustacés de la *Princesse-Alice*, fasc. 13, p. 13, 1899.

Diagnosis.—Eyes and pair of frontal spines of subequal length. Fingers little less than half length of palm. Propodus of last leg plumed on both sides. Female abdomen with four lateral spines.

Description.—Carapace finely granulate, truncate in front and armed with two long divergent horns between which a slender spine-

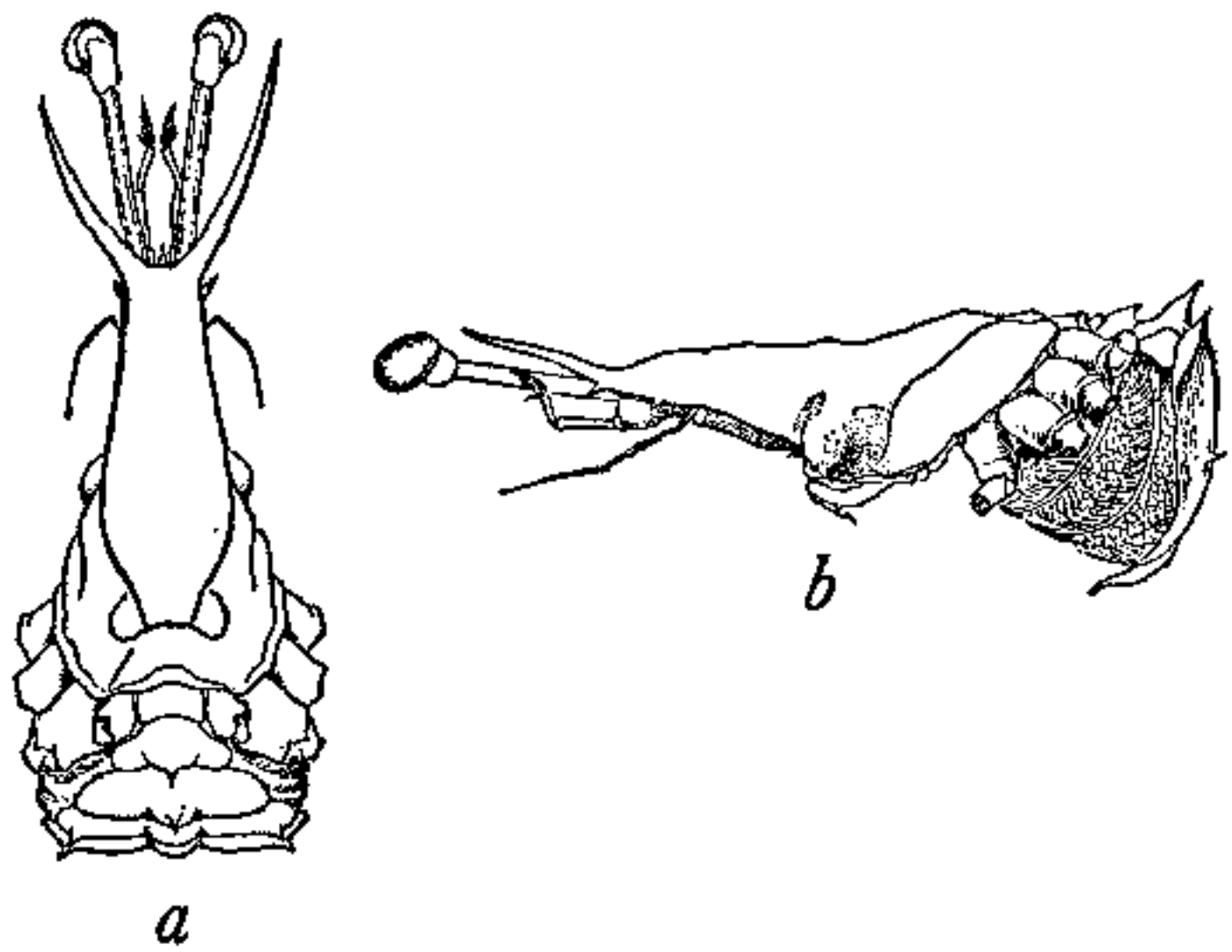


FIGURE 18.—*Latreillia elegans*, female: *a*, Dorsal view, lacking chelipeds and legs; *b*, left side. × 2.

like rostrum projects obliquely downward; each of the lateral horns is armed with three spinules separated by subequal intervals. Front margin of carapace with a small acute spine projecting downward at outer base of eyestalks. Abdomen broad in both sexes terminating in a short spine; in the female, the first segment has a median tubercle, second and third segments each with a strong median spine, fourth and fifth segments (fused to sixth) with a spine near each lateral margin; in the male the segments are distinct and there is a spine on second segment. Eyes pyriform, with their slender stalks about equal in length to the supraorbital horns. Chelipeds very slender, three times as long as body and about half as long as third ambulatories; chela a little longer than carpus; dactylus a little less than half the length of palm. Legs very long, almost filiform, their basal, ischial and meral articles spinulous; dactyls very short.

Color.—Yellowish; legs with red bands. (Milne Edwards.)

Measurements.—Length of carapace of female (19296) 12.7, width 7.8, horn 8, length of third leg 79 mm.

Range.—Both sides of North Atlantic Ocean; Mediterranean Sea; 70 to 200 fathoms. Natal, 25 fathoms (Stebbing).

Material examined.—See table 21, p. 76.

Subtribe OXYSTOMATA De Haan

Oxystomata DE HAAN, Fauna Japonica, Crustacea, p. 111, 1841 (not Raninoidea).—DANA, United States Exploring Expedition, Crustacea, pt. 1, p. 389, 1852.—MIERS, Voyage of H. M. S. *Challenger*, Brachyura, vol. 17, p. 337, 1886.—ORTMANN, Zool. Jahrb. (Abt. Syst.), vol. 6, p. 550, 1892.

Oxystoma or Leucosoidea ALCOCK, Journ. Asiat. Soc. Bengal, vol. 65, pt. 2, no. 2, p. 135, 1896.

Epistome reduced or absent. The efferent branchial channels terminate at middle of buccal area, the buccal cavern produced forward and generally of an elongate triangular shape; the efferent channels are closed in by an elongate lamellar process of the exopods of the first maxillipeds. The afferent branchial openings are either in front of bases of chelipeds or at sides of endostome. Branchiae six to nine on either side. The antennules fold either longitudinally or obliquely, rarely transversely. In the male the genital ducts protrude either side through the bases of the fifth pair of legs or through the fifth thoracic sternum close by. (After Alcock.)

KEY TO THE FAMILIES OF THE SUBTRIBE OXYSTOMATA

A[1]. Carapace short, exposing the first two or three abdominal terga in dorsal view ..... **Dorippidae** (p. 75)

A[2]. Carapace of ordinary brachyurous shape.

B[1]. Afferent branchial openings on either side of endostome. **Leucosiidae** (p. 121)

B[2]. Afferent branchial openings in front of bases of chelipeds. **Calappidae** (p. 196)

Family DORIPPIDAE Dana

Dorippiens MILNE EDWARDS, Histoire naturelle des Crustacés, vol. 2, p. 151 (partim), 1837.

Dorippidea DE HAAN, Fauna Japonica, Crustacea, p. 120, 1841.

Dorippidae DANA, United States Exploring Expedition, Crustacea, pt. 1, p. 390, 1852.—MIERS, Voyage of H. M. S. *Challenger*, Brachyura, vol. 17, p. 326, 1886.—ALCOCK, Journ. Asiat. Soc. Bengal, vol. 65, p. 273, 1896.—IHLE, Die Decapoda Brachyura der *Siboga*-Expedition, monogr. 39 b[1], p. 98, 1916.

Carapace typically flat, hiding not much more than half of the abdominal terga, the first three of which are commonly visible in a dorsal view, quite uncovered. Orbits somewhat incomplete. Antennules often too large to fold inside their fossettes. Antennae large. Buccal cavern prolonged forward to form an efferent branchial canal. First two pairs of true legs remarkably long and stout; last two pairs remarkably short and slender and occupy a singular position in the dorsal plane of the body. The vasa deferentia perforate the fifth thoracic sternum on either side.

TABLE 21.—*Material examined of* Latreillia elegans

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″			°F.						
MASSACHUSETTS:											
Off Nantucket Shoals	39 57 30	69 41 10	78	gy. S.		Aug. 6, 1884	2199	*Albatross*	1 ♀	8044	
Do	39 54 00	69 51 30	134	hrd. S. Sponges	52	Aug. 4, 1881	940	*Fish Hawk*	4 ♂ 4 ♀ (2 ovig.) 7	19296 P. M. Y. U.	
Do	40 00 00	69 19 00	93	fne. S.	48.5	Sept. 14, 1881	1027	do	1 ♂	6741	A. M. Norman collection.
Do	40 05 39	70 23 52	86	S. G. Sh. Sponges	50.5	Sept. 4, 1880	872	do	2 ♀ 1 ♀	19295 P. M. Y. U.	
S. of Marthas Vineyard.	40 05 00	70 34 45	70	bu. M.	50	Sept. 20, 1883	2085	*Albatross*	1 ♀	5378	
Do	40 00 00	70 57 00	85	sft. stky. M.	51	Sept. 13, 1880	874	*Fish Hawk*	fragment	P. M. Y. U.	
DELAWARE: Off Capes of Delaware.	38 39 00	73 11 00	130	S.	49	Oct. 10, 1881	1043	do	1 ♀	do	
NORTH CAROLINA:											
Between Capes Hatteras and Lookout.	34 39 15	75 33 30	107	gy. S. P.		Oct. 1, 1885	2601	*Albatross*	1 ♂	21698	
30 mi. S. of Cape Lookout.			100–200					*Fish Hawk*	1 ♂ 2 ♀ (1 ovig.)	51060	
FLORIDA:											
Off American Shoal Light.	About 10 mi. N. by W. ½ W.		105–110			June 27, 1893	52	State Univ. Iowa Bahama Exped.	1 ♂ 1 ♀	57071	
Gulf Stream off Key West.	24 19 00	81 39 45	120	Co.	68.5	Feb. 26, 1902	7208	*Fish Hawk*	2 ♀ ovig.	55989	
Do	24 17 05	81 58 25	132	S.	52	Feb. 14, 1902	7280	do	2 ♂ 1 ♀ ovig.	67740	
Sambo, near Key West			120			1916		J. B. Henderson	1 ♀ ovig.	55988	
Western Dry Rocks, near Key West.			144			1916		do	1 ♂	55987	
CUBA: Off Habana	23 10 39	82 18 48	130	fne. Co.		Jan. 17, 1885	2320	*Albatross*	1 ♂	21697	

KEY TO THE AMERICAN GENERA OF THE FAMILY DORIPPIDAE

A¹. The external maxillipeds leave all the anterior part of buccal cavern uncovered.
  B¹. Basal segments of antennules normal. Eyestalks movable, directed forward ..... **Ethusa** (p. 77)
  B². Basal segments of antennules very large and swollen, crowding eyes and antennae almost transversely. Eyestalks immovable ..... **Ethusina** (p. 89)
A². The external maxillipeds are greatly elongate and do not leave any appreciable portion of buccal cavern uncovered.
  B¹. Carapace quadrate. Rostrum rather narrow, triangular, acute at end. Afferent orifices reduced or rudimentary. Efferent orifices more or less separate and situated behind the front.
    C¹. Eyes without pigment. Antennules large, unconcealed. Merus of outer maxilliped produced forward far beyond carpal articulation ..... **Cymonomus** (p. 96)
    C². Eyes normally developed. Antennules folding under front. Merus of outer maxilliped not overreaching palp ..... **Cymopolus** (p. 98)
  B². Carapace oval or subcircular. Rostrum little prominent or divided at end. Efferent orifices contiguous and united in a gutter approaching frontal border; no afferent opening at base of anterior feet.
    C¹. Carapace transversely oval, branchial regions much dilated in all directions. Efferent orifices reaching anterior border of front, which is triangular, obtuse. Eyes pigmented ..... **Corycodus** (p. 101)
    C². Carapace subcircular.
      D¹. Antennules long, incapable of folding into antennular cavity. Antennae with narrow peduncle ..... **Cyclodorippe** (p. 103)
      D². Antennules small, completely retractile; antennae very short, with valviform peduncle ..... **Clythrocerus** (p. 109)

Genus ETHUSA Roux

Ethusa Roux, Crustacés de la Méditerranée et de son littoral, p. [81], 1828 (type, *E. mascarone* Roux).

Pridope Nardo, *Mem. Ist. Veneto, vol. 14, p. 307, 1868 (type, P. typica Nardo).*

Carapace flat, truncate-oblong and broadest behind, covering little more than the first two thoracic sterna; hepatic region small. The front consists of two laminar teeth, each of which is bifid. A tooth or spine at antero-external angle of carapace. The antennules fold obliquely; they are large and project beyond their fossae. The antennae have a long flagellum; their basal article is inserted between the eyestalk and the basal antennular article, but on a slightly lower level. The buccal cavern is elongate-triangular and does not extend to the front; the external maxillipeds cover only its basal three-fourths, but the distal part is closed in by the stout, foliaceous processes of the first maxillipeds. The palp of the external maxillipeds arises from the summit of the merus and is completely exposed in flexion. The

afferent branchial orifices are wide openings immediately in front of bases of chelipeds. Chelipeds in adult male often unequal. First and second pairs of ambulatory legs long and usually rather stout. The last two pairs short and rather slight; they arise much higher than the other legs and have a small hooklike dactylus folding backward. The abdomen of the male usually consists of five pieces, the third to fifth segments being fused or partially so; that of the female consists of seven separate segments; the first three segments visible in dorsal view.

East and west coasts of Middle America, eastern Atlantic and Mediterranean, and Indo-Pacific region.

KEY TO THE AMERICAN SPECIES OF THE GENUS ETHUSA

A¹. Eyestalks long, extending laterally beyond outer orbital spine.
  B¹. Outer orbital spine directed obliquely forward. **mascarone americana** (p. 78)
  B². Outer orbital spine directed longitudinally forward. **mascarone panamensis** (p. 79)
A². Eyestalks short, not extending beyond outer orbital spine.
  B¹. Branchial regions separated by the cardiac and gastric regions.
    C¹. Dactyls of first and second ambulatories flattened above.
      D¹. Carapace as broad as, or broader than long.
        E¹. Eyestalks longer than cornea. Appendages of second abdominal segment of male shorter than those of first segment ..... **microphthalma** (p. 82)
        E². Eyestalks very short, much stouter than cornea. Appendages of second abdominal segment of male longer than those of first segment ..... **lata** (p. 84)
      D². Carapace longer than broad ..... **truncata** (p. 85)
    C². Dactyls of first and second ambulatories not flattened **tenuipes** (p. 87)
  B². Branchial regions meeting on median line, separating cardiac from gastric region ..... **ciliatifrons** (p. 88)

ANALOGOUS SPECIES OF ETHUSA ON OPPOSITE SIDES OF THE CONTINENT

Atlantic	Pacific
mascarone americana (and Pacific).	*mascarone panamensis.*
microphthalma.	*lata.*

ETHUSA MASCARONE AMERICANA A. Milne Edwards

Plate 22, Figure 2; Plate 23, Figure 2

Ethusa americana A. Milne Edwards, Bull. Mus. Comp. Zool., vol. 8, p. 30, 1880 (type localities, West Florida, 13 fathoms, type in M. C. Z., and lat. 26°16′ N., 20 fathoms, type in Paris Mus.).—A. Milne Edwards and Bouvier, Mem. Mus. Comp. Zool., vol. 27, p. 67, pl. 13, figs. 1-4, 1902.

Ethusa mascarone americana Rathbun, Proc. Biol. Soc. Washington, vol. 11, p. 109, 1897; Bull. Lab. Nat. Hist. State Univ. Iowa, vol. 4, p. 293, 1898; Bull. U. S. Fish Comm. for 1900, vol. 20, pt. 2, p. 89, 1901.—Finnegan, Journ. Linn. Soc. London, Zool., vol. 37, p. 615, 1931.

Ethusa mascarone (pars) BOUVIER, Bull. Soc. Philom. Paris, ser. 8, vol. 9 (1896–1897), p. 65, 1898.

Diagnosis.—Eyestalks long, extending laterally beyond postorbital spine. Carapace elongate, not much wider posteriorly then anteriorly.

Description.—Carapace somewhat lyre-shaped; length about one-fifth greater than width in male, one-seventh greater in female; surface smooth and finely pubescent. Regions well marked; branchial regions moderately swollen; they and the cardiac region are equally high. Spine at antero-external angle of carapace and at external end of orbit, broad at base but tapering to slender and acute, and projecting obliquely forward as far as the line of the median sinus. The divisions of the frontal teeth are sharp spines well separated and equally advanced. Eyestalks long, rather slender, extending laterally by the full length of the cornea beyond the antero-external spines. Chelipeds equal, not strong, reaching to end of carpus of the first leg; this leg reaches about to middle of dactylus of second leg; the second pair in male is 2.5 times length of carapace, in female not so long.

Measurements.—Male (24518), entire length of carapace 7, width 5.8 mm.; female (17880), entire length of carapace 10.7, width 9.4 mm.

Range.—North Carolina to Gulf of Mexico and West Indies. Gulf of California; Taboga Island, Panama (Finnegan). Shallow water to 45 fathoms.

Material examined.—See table 22, page 80.

ETHUSA MASCARONE PANAMENSIS *Finnegan*

PLATE 22, FIGURE 1; PLATE 23, FIGURE 1

Ethusa mascarone americana RATHBUN, Proc. U. S. Nat. Mus., vol. 21, p. 615, 1898; not *E. americana* A. Milne Edwards.

Ethusa mascarone var. *panamensis* FINNEGAN, Journ. Linn. Soc. London, Zool., vol. 37, p. 616, 1931 (type locality, Perlas Island; type in Brit. Mus.).

Diagnosis.—External-orbital spine shorter than any frontal teeth and forwardly directed. Distance between tips of frontal teeth on one side very little less than distance between tips of median pair.

Remarks.—The specimens examined have a patch of fine granulations on all the protuberances; only in the smaller specimen (22143) is there evidence of the tubercles figured by Milne Edwards and Bouvier; the tubercles are not sharp and the specimen is of the same size as the type of *E. americana*.

Measurements.—Female (66797), total length of carapace 9, width 8.5 mm.

Range.—Mexico to Ecuador.

Material examined.—See table 23, page 81.

TABLE 22.—*Material examined of* Ethusa mascarone americana

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
Atlantic											
NORTH CAROLINA:	° ′ ″	° ′ ″			°*F.*						
Off Cape Fear	33 37 30	77 36 30	14	crs. yl. S. brk. Sh		Oct. 20, 1885	2617	*Albatross*	1 ♀	17883	
FLORIDA:											
Off Key West			Shallow			1893	45	State Univ. Iowa Bahama Exped.		S. U. I.	
West Florida			13					*Bache*; Wm. Stimpson.	1 ♂	3059, M. C. Z.	Type.
Tortugas	About 9 mi. S. of SW. Channel buoy.		20			Aug. 16, 1924	7	W. L. Schmitt	1 ♀ y	66800	Gift of Carnegie Institution.
Do	10 mi. S. of no. 2 red buoy.		35-37	crs. S. Bryozoa		June 10, 1925	206	do	1 ♂	66804	Do.
Do	8 mi. S. of no. 2 red buoy.		25	Co. R		June 11, 1926	217	do	1 ♀	66805	Do.
Do	Over 10 mi. SW. of no. 2 red buoy.		45	sft. gy. cold Oz		do	218	do	1 ♂	66803	Do.
NW. of Tortugas	25 02 00	83 34 00	37	Sh. S. Co. plant & algae.	69.5	Feb. 17, 1889	5057	*Grampus*	1 ♀	15273	
Do	25 02 49	83 14 00	32	brk. Sh. fne. & crs. Co.	68.5	Feb. 16, 1889	5055	do	1 ♂	15274	
Do	25 24 30	83 06 00	30	fne. gy. S. bk. Sp	69	Feb. 28, 1889	5071	do	1 y.	23640	
W. of Sanibel Islands	26 19 00	83 33 00	36	S. Co	69.5	Mar. 18, 1889	5106	do	1 ♂	15275	
					°*C.*						
SW. of Anclote Keys	28 01 30	83 12 30	13	rky. Sh	14	Jan. 23, 1902	7233	*Fish Hawk*	1 ♂	66806	
Anclote Section	Anclote Light bearing E. ⅞ N., 21½ mi.		12½	R. Co. S	17.2	Mar. 28, 1901	7106	do	1 ♂	25605	
St. Martin Reef	28 34 30	83 15 45	7½	rky. sdy	13	Jan. 15, 1902	7220	do	1 ♀	66801	
					°*F.*						
Off Cedar Keys	Cedar Keys Light, N. ¾ E. 21¾ mi.		5¾	Co	63.45	Jan. 11, 1913	7807	do	1 ♀	66802	
SE. of Cape St. George.	28 47 30	84 37 00	24	Co. brk. Sh		Mar. 15, 1885	2407	*Albatross*	1 ♂	17882	
SW. of Cape San Blas	29 15 30	85 29 30	27	G		Feb. 7, 1885	2372	do	1 ♂	17881	
Do	29 18 15	85 32 00	25	crs. gy. S. brk. Sh		do	2370	do	1 ♀	17880	
PUERTO RICO: Off Culebra Island.	Point Mula lighthouse SW. ½ S., 8½ mi.		14¾	Co. S		Feb. 8, 1899	6086	*Fish Hawk*	1 ♂	24518	

ST. THOMAS:										
St. Thomas					1884		*Albatross*	2 ♀	17884	
Off St. Thomas	Sail Rock W. by N. ½ N.	20–23	Co		Feb. 6, 1899	6079	*Fish Hawk*	1 ♀	24517	
Pacific										
MEXICO:										
Tiburon Island, Gulf of California.	Fresh Water Bay	20			Jan. 1, 1932	205	S. A. Glassell	1 ♂	Glassell coll.	
Off Cape St. Lucas	22 52 00 109 55 00	31	rky	74.1	May 1, 1888	2829	*Albatross*	1 ♀	22143	

TABLE 23.—*Material examined of* Ethusa mascarone panamensis

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
MEXICO:	° ′ ″	° ′ ″									
Isabel Island	Dredging all around isle.		10–25			Mar. 5, 1934	277	*Velero III*	1 ♂	69188	Hancock Galapagos Exped.
10 miles W. of mouth of Bayona River, Sinaloa.	*22 38 00*	*105 55 00*	*12–17*				*T. 6 R.*	*Zaca, Crocker* Exped.	1 ♀ ovig.	*Cal. Acad.* Sci.	
COSTA RICA:											
Puerto Culebra, Cocos Bay.			2–4			Mar. 13, 1933	116	*Velero III*	6 ♂ 4 ♀	67755	Hancock Galapagos Exped.
Do	Dredging around isles in bay.					Feb. 25, 1934	257	do	5 ♂ 5 ♀	69190	Do.
PANAMA:											
Shore of Panama			Low tide	Rocks		May–July 1924		Elizabeth Deichmann.	1 ovig. ♀	66797	
Bahia Honda						Jan. 10, 1933	5	*Velero III*	1 ♂	69191	Hancock Galapagos Exped.
Perlas Islands and Chame Point.						Jan., 1934		E. D. Robson	1 ♀	69406	
ECUADOR:	*Latitude S.*										
La Libertad	Dredging along village beach.					Jan. 18, 1933	9	*Velero III*	2 ♂		Hancock Galapagos Exped.
Do	N. of Point St. Elena		8–10			Feb. 9, 1934	209	do	1 y	69189	Do.

ETHUSA MICROPHTHALMA Smith

PLATE 22, FIGURE 3; PLATE 23, FIGURE 3

Ethusa microphthalma SMITH, Proc. U. S. Nat. Mus., vol. 3, p. 418, 1881 (type locality, off Marthas Vineyard, Mass., 142½ fathoms, station 878, *Fish Hawk*; type, U.S.N.M. no. 7300); Proc. U. S. Nat. Mus., vol. 6, p. 22, 1883.

Diagnosis.—Eyestalks longer than cornea. Dactyli of first and second ambulatories vertically compressed. Appendages of second abdominal segment of male shorter than those of first segment.

Description.—Carapace as broad as or broader than long, very much narrowed anteriorly so that in front it is only half or less than half as broad as the widest part, which is at the swollen branchial regions posteriorly. Front between the orbits half or less than half as wide as the entire front and, as seen from above, is divided by a triangular median sinus and two slightly less deep sinuses at the extremities of the antennular fossae; the angles between and outside these sinuses are spiniform, so that the front between the eyes is armed with four similar and nearly equidistant spines, of which the lateral are slightly more prominent than the median. Orbital sinuses nearly as deep as broad and formed on the outside by the spiniform anterolateral angles, which reach farther forward than the spines of the front. Anterolateral margins long and nearly straight. Dorsal surface slightly convex and not deeply areolated though the cervical suture is well marked and the whole surface is granular and pubescent. Eyes small, on very short peduncles, so that they do not nearly reach the angles of the orbital sinuses; cornea terminal, not expanded, pigment black.

Chelipeds of female equal, small and very slender; chela scarcely stouter than carpus, the basal portion smooth and nearly cylindrical and the digits alike, fully as long as the manus, strongly compressed, longitudinally grooved, slightly curved laterally, prehensile edges nearly straight, and very regularly dentate. Chelipeds of male very unequal, the left is slender like those of the female, the right is considerably longer than the left and has a stout and swollen chela, about four times as high and two and one-half times as thick as the left; the fingers much shorter than the manus, tapering to the tip, prehensile edges oblique and unarmed; carpus and merus much longer and stouter than in the left cheliped. The first two pairs of ambulatories are twice as long as the minor cheliped and nearly naked, propodus shorter than merus, slightly grooved longitudinally, dactylus longer than propodus, much compressed vertically, slightly curved, of nearly uniform breadth to a short distance from the acuminate tip, and strongly carinate. Third and fourth pairs of ambulatories nearly alike, not half so long as first and second, slender, and covered with short pubescence except on the dactyls, which are very short and strongly curved.

TABLE 24.—*Material examined of* Ethusa microphthalma

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
MASSACHUSETTS:	° ′ ″	° ′ ″			° F.						
Off Marthas Vineyard	40 07 48	70 43 54	67	gn. M	52	July 16, 1881	921	*Fish Hawk*	1♂1♀	18451	
Do	39 55 00	70 54 15	142½	M	52	Sept. 13, 1880	878	do	1♀	7300	Holotype.
DELAWARE: Off Delaware Bay.	38 31 00	73 21 00	156	S	49	Oct. 10, 1881	1047	do	1♂	18452	
NORTH CAROLINA: East of Currituck Sound.	36 20 24	74 46 30	119	dk. gy. M. fne. S	51.5	June 4, 1885	2425	*Albatross*	1♀	19860	
FLORIDA:											
Tortugas: S. of no. 2 red buoy.	About 13 mi. S		80			July 13, 1930	10	W. L. Schmitt	4♂	66825	Gift of Carnegie Institution.
Do	About 14 mi. S		80–60			July 14, 1930	12	do	5♂	66829	Do.
Do	About 15 mi. S		110			July 15, 1930	14	do	3♂3♀ (2 ovig.)	66828	Do.
Do	About 13 mi. S		80–100			July 29, 1930	35	do	5♂2♀ (1 ovig.)	66821	Do.
Do	About 16 mi. S		125–65			June 30, 1932	25	do	3♂1♀	66827	Do.
Do	do		60			do	26	do	1♀	66826	Do.
Do	About 20 mi. S		315–295			July 19, 1932	54	do	1♂	66823	Do.
Do	About 14 mi. S		94–83			July 23, 1932	58	do	4♂	66822	Do.
Do	About 13 mi. S		83–91			do	59	do	2♂3♀ 3♂y	66830 66824	Do.
W. of Tampa Bay	28 36 00	85 33 30	111	gy. M		Mar. 14, 1885	2402	*Albatross*	1♂	19861	
CUBA: Off Santiago de Cuba.	19 56 25	75 49 49	175	gy M. S. brk. Sh		Feb. 27, 1884	2130	do	1♂	7822	

Southern specimens are much larger than northern, and have the carapace thickly covered with a short, soft pile, and the edge of the front concealed by a fringe of short hair.

Color.—Carapace salmon under dense cream-buff pubescence; corneae gray; tips of fingers white; legs a light flame scarlet, darkest, on dactyls to lightest on proximal half of back of merus. (W. L. Schmitt.)

Measurements.—Male (66821), length of carapace to tip of submedian spine 26.3, width 27.8 mm. Female (66824), length of carapace to tip of submedian spine 25.7, width 26.6 mm.

Range.—Off Marthas Vineyard, Mass., to west Florida and Cuba; 60 to 315 fathoms.

Material examined.—See table 24, page 83.

ETHUSA LATA Rathbun

FIGURE 19; PLATE 24, FIGURE 1; PLATE 25, FIGURE 1; PLATE 28, FIGURE 3

Ethusa lata RATHBUN, Proc. U. S. Nat. Mus., vol. 16, p. 258, 1893 (type locality, Gulf of California, 33 fathoms; type, U.S.N.M. no. 17483); vol. 21, p. 615, 1898.

Aethusa pubescens FAXON, Bull. Mus. Comp. Zool., vol. 24, p. 160, 1893 (type locality, off Panama, 100 fathoms; type in M. C. Z.).

Aethusa lata FAXON, Mem. Mus. Comp. Zool., vol. 18, p. 35, pl. 6, fig. 1, 1a, 1b, 1895.

Diagnosis.—Eyestalks very short, much stouter than cornea. Dactyli of first and second ambulatories vertically compressed. Appendages of second abdominal segment of male slender and longer than those of first segment.

Description.—Carapace broader than long, densely pubescent; frontal margin ciliated; cervical and cardiac sutures well marked;

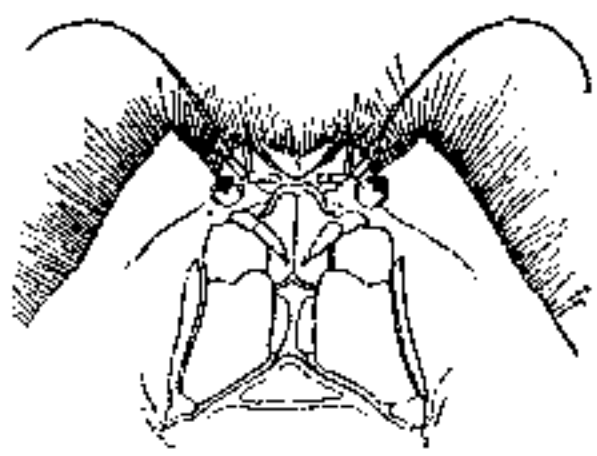


FIGURE 19.—*Ethusa lata*, female: Antennal and oral region, slightly enlarged. After Faxon.

the narrow urogastric region much depressed. Of the frontal teeth the submedian are more widely and deeply separated from each other than from the lateral. The type of *A. pubescens*, the largest specimen known, is an exception, the median sinus slightly shallower than the lateral. Anterolateral tooth nearly as advanced as front. Eyes very short and stout; cornea circular, directed downward. The larger (right) cheliped of the male has a subglobular carpus produced inwardly in a rounded lobe; chela oval, convex above and below;

palm longer than fingers, immovable finger triangular, prehensile edge concave; on both fingers finely crenulate, tips overlapping. Chela of minor palm convex above, concave below; fingers carinate, inner edges denticulate, longer than upper margin of palm. Dactyls of first and second ambulatories flattened above, as long as meri. Sternum coarsely granulate. Male abdomen narrow; coalesced segments (3–5) gradually narrowing; sixth segment nearly square, outer margins curved slightly inward; telson triangular, length and breadth subequal, sides arcuate.

Measurements.—Female, type of *pubescens*, total length 26, breadth 29 mm. Male (22150), length 13, breadth 14 mm.

Range.—Lower California, Mexico, to Ecuador; 2 to 100 fathoms.

Material examined.—See table 25, page 86.

ETHUSA TRUNCATA A. Milne Edwards and Bouvier

PLATE 28, FIGURES 1, 2

Ethusa truncata A. MILNE EDWARDS and BOUVIER, Bull. Mus. Hist. Nat., Paris, vol. 5, p. 384, 1899 [type locality, Gulf of Mexico (not Antilles), 118–119 fathoms; cotypes in Paris Mus. and M. C. Z.]; Mem. Mus. Comp. Zool., vol. 27, p. 69, pl. 13, figs. 5–8, 1902.

Diagnosis.—Eyestalks short and stout, less pigmented above than below. Sinuses of front shallow. Dactyli of first and second ambulatories vertically compressed and unusually long, exceeding their respective meri.

Description.—Carapace longer than wide, slightly but regularly convex from side to side. Cardiac area pitcher-shaped, well delimited except in front, where it is continuous with the urogastric lobe; behind it there is a small, very prominent, and completely isolated lobe. Mesogastric lobe a plainly marked elevation continued almost to the frontal sinus; behind, in the wide part the limits are indistinct, also the anterior limit of the metagastric lobes which, as customary, are fused with it. The branchial suture is scarcely apparent on the dorsum, the cervical suture is much more visible, especially near the gastric area. Front rather narrow, median sinus very shallow which gives it a truncate aspect. The spiniform teeth which delimit this sinus are little prominent, somewhat less so than the spines at the external angle of the frontal border; these spines are attached by a straight border to the curve of the upper orbital sinus. They are a little larger than the outer orbital spine, which is not prominent. The next to the last article of the antennal peduncle does not attain the extremity of the spine and the last article surpasses it but little. A velvet formed of scattered hairs is always more or less on the carapace. Eyestalks stout, short, surpassing outer orbital spine; their black cornea covers only a part of the upper face but extends all over the lower face. Antennal flagella bare, not reaching end of chelae.

TABLE 25.—*Material examined of* Ethusa lata

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″			° F.						
MEXICO:											
20 miles S. of San Roque Island.			50					S. A. Glassell	1 ♂	Glassell coll.	
Off Abreojos Point, Lower California.	26 14 00	113 13 00	48	yl. M	53.9	May 3, 1888	2834	*Albatross*	5 ♂ 2 ♀ immat	22150	
Magdalena Bay, Lower California.	24 38 00	112 17 30	51	gn. M	51	May 2, 1888	2833	do	2 ♀	22149	
Off Cape St. Lucas, Lower California.	23 33 00	110 37 00	66	fne. S	74.1	May 1, 1888	2830	do	1 ♂	22148	
Off La Paz Bay, Gulf of California.	24 18 00	110 22 00	26½	brk. Sh		Apr. 30, 1888	2823	do	1 ♂ 1 ♀ immat.	22147	
Gulf of California	28 23 45	111 58 00	14	gy. S. brk. Sh	65	Mar. 23, 1889	3013	do	1 ♂ 1 ♀	17482	
Off San Felipe Bay, Gulf of California.	31 06 45	114 28 15	33	gn. M	63.8	Mar. 27, 1889	3031	do	1 ♂	17483	Holotype.
Petatlan Bay	S. and W. of White Friars Island.		25			Mar. 2, 1934	264	*Velero III*	1 y	69184	Hancock Galapagos Exped.
Tangola-Tangola Bay.			15–20			Feb. 28, 1934	259	do	1 ♀ y	69182	Do.
COSTA RICA:											
Cocos Bay, Puerto Culebra.			2–4			Mar. 13, 1933	116	do	1 ♂	67754	Do.
Puerto Culebra	In bay		10			Feb. 24, 1934	253	do	1 y	69183	Do.
Cocos Island	5 31 30	86 52 30	100	rky	57	Feb. 28, 1891	3367	do	1 ♀	4499, M. C. Z.	Holotype of *Aethusa pubescens*.
PANAMA:											
Bay of Panama	8 27 00	79 35 00	26	gn. M		Mar. 30, 1888	2803	*Albatross*	1 ♂	22145	
Do	7 56 00	79 41 30	51½	gn. M		do	2805	do	1 ♀	22146	
Do	7 37 00	78 46 30	62	gy. S. bk. Sp. brk. Sh.	59.6	Mar. 5, 1888	2794	do	3 ♂	22144	
COLOMBIA:											
Port Utria	W. side of terminal island.		20			Feb. 14, 1934	234	*Velero III*	1 y	69181	Hancock Galapagos Exped.
Do	Near small island		20	M		do	233	do	2 y	69179	Do.
ECUADOR:	*Latitude S.*										
La Plata Island			45–55	S. Shale R		Feb. 10, 1934	212	do	1 ♀ ovig., 4 y	69178	Do.
Galapagos Islands	S. of Tagus Cove, Albemarle Island.		30			Jan. 13, 1934	147	do	1 y	69, 180	Do.

Chelipeds bare, carpus short, chela very long, especially the fingers; these are bent inward toward the base in relation to the palm; they are wider than the palm, gaping a little at base and finely denticulate. The first two pairs of ambulatories are sparsely pubescent at various points, especially on the margins and on the outer surface of the dactyl; this last is longer than the preceding article, compressed vertically and finely acuminate; its inner face is slightly convex and armed with a line of short bristles; its outer face is much more hairy and presents some traces of two longitudinal prominences. The propodus does not narrow sensibly in its distal part and presents a very slight curvature. The last two pairs of feet are a little more pubescent than the others. Abdomen of male characterized by its narrowness and the strong dorsal convexity of all of its articles, above all those of the median part. The segments are all independent, the sixth shorter than the preceding and much shorter than the telson. (After Milne Edwards and Bouvier.)

Measurements.—Male (*Blake* station 49), length of carapace 4.7, width 3.8 mm.

Range.—Gulf of Mexico to Trinidad, British West Indies.

Records.—As follows:

Florida: West of Charlotte Harbor; lat. 26°31′00″ N., long. 85°53′00″W.; 119 fathoms; 1877–78; station 50, *Blake;* 1 male, cotype (M. C. Z. no. 6657).

Louisiana: Off Delta of Mississippi; lat. 28°51′30″ N., long. 89°01′30″ W., 118 fathoms; 1877–78; station 49, *Blake;* 1 male, cotype (Paris Mus.). Not examined by the author.

Venezuela: Northwest of Trinidad; lat. 11°07′00″ N., long. 62° 14′30″ W.; 73 fathoms; bu. M.; January 30, 1884; station 2120, *Albatross;* 1 young male, soft shell (18455); specimen in bad condition.

ETHUSA TENUIPES Rathbun

PLATE 24, FIGURE 3; PLATE 25, FIGURE 3

Ethusa tenuipes RATHBUN, Proc. Biol. Soc. Washington, vol. 11, p. 110, 1897 (type locality, off Key West, 50 fathoms; type, U. S. N. M. no. 19855); Bull. Lab. Nat. Hist. State Univ. Iowa, vol. 4, p. 293, 1898.

Diagnosis.—Eyestalks short, the first article of the antenna reaching the cornea. Dactyli of first and second ambulatories not compressed. Appendages of second abdominal segment very slender and much longer than those of first segment.

Description.—Closely allied to *E. microphthalma* but much smaller; shape of carapace and outline of front similar; cardiac region more elevated and surrounded by a deeper groove. Abdomen of male narrow; penultimate segment slightly narrower at distal than at proximal end. The appendages of the first segment have a lanceolate, foliaceous extremity and sheath the appendages of the second

segment, which extend far beyond those of the first and have slender, converging tips. Right chela of male swollen, upper and lower margins convex. Dactyli of first and second ambulatories as long as the merus, not compressed but with four sides of subequal width, each with a carina.

Measurements.—Male holotype (19855), total length of carapace 6, width 5.5 mm; ovigerous female (66815), total length of carapace 11, width 11.1 mm.

Range.—East Florida to Gulf of Mexico; 25 to 118 fathoms.

Material examined.—See table 26, page 90.

ETHUSA CILIATIFRONS Faxon

FIGURE 20; PLATE 24, FIGURE 2; PLATE 25, FIGURE 2; PLATE 28, FIGURE 4

Aethusa ciliatifrons FAXON, Bull. Mus. Comp. Zool., vol. 24, p. 159, 1893 (type locality, Bay of Panama, 153 fathoms; type, U. S. N. M. no. 20630); Mem. Mus. Comp. Zool., vol. 18, p. 34, pl. 5, fig. 3, 3a, 3b, 1895.

Diagnosis.—Cardiac separated from gastric region by the meeting of the branchial regions on the median line. Both chelipeds of male slender. Eyestalks very short. Appendages of second abdominal segment slender and no longer than those of first segment.

Description.—Carapace broader than long, branchial regions much inflated; surface granulated on branchial and cardiac regions, pubes-

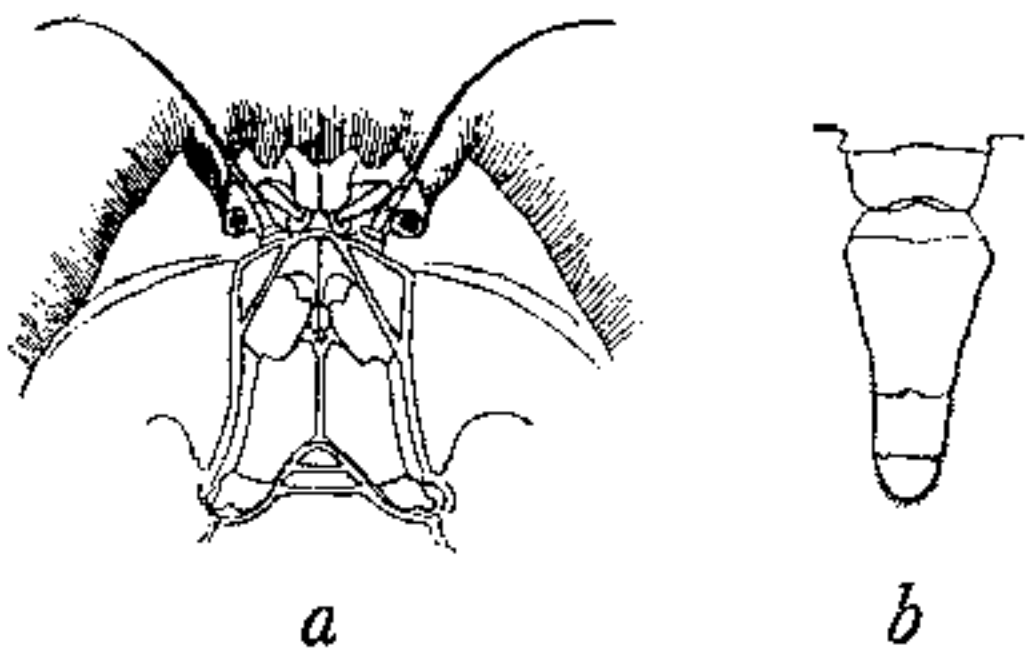


FIGURE 20.—*Ethusa ciliatifrons*, male: *a*, Anterior part from below; *b*, abdomen. Slightly enlarged. After Faxon.

cent on gastric region; front and anterior part of lateral border ornamented with long up-turned cilia. Front between the orbits divided by a triangular median sinus and two slightly shallower lateral sinuses into four triangular teeth of equal length. Orbital sinuses very deep, the external orbital angles reach as far forward as the frontal teeth. Dorsal surface of carapace deeply areolated; the branchio-cardiac lines are deeply impressed and meet in the median line in front of the heart, cutting off the depressed cardiac area from the gastric. Gastric region uneven with pits and furrows. Eyes small, on very short peduncles, just reaching, when extended, to the posterior angles of the orbital sinuses; the eye is terminal, not wider than the peduncles,

and black in color. Chelipeds equal, small, slender; chela smooth, not more robust than carpus; fingers longer than palm, laterally compressed, curved inward, longitudinally grooved, their prehensile edges straight and regularly denticulated. The two ambulatories are very long, the second considerably longer than the first, naked and granulated; propodus a little shorter than merus, slightly compressed, with a longitudinal groove on each side; dactylus one half longer than propodus, vertically compressed, slightly curved, longitudinally grooved and ribbed, upper edge very sharp. Last two limbs of about equal length, not reaching beyond the distal end of the merus of the second ambulatory, pubescent, except the nail at tip of dactylus; propodus much shorter than merus and not much longer than carpus; dactyli very short and strongly curved. Sternum rather coarsely granulate.

Color.—Conspicuous red transverse bands on chelipeds and first two pairs of ambulatories; two bands on merus, one on carpus, one on propodus, and one on dactylus.

Measurements.—Male, cotype (M. C. Z. no. 4498), length of carapace 26.5, breadth 29.5 mm.

Range.—Bay of Panama, 127 to 259 fathoms.

Material examined.—See table 27, p. 90.

Genus ETHUSINA Smith

Ethusina Smith, Rept. U. S. Comm. Fish and Fisheries for 1882, p. 349 (5), 1884 (type, *E. abyssicola* Smith).

Nearly allied to *Ethusa*, from which it differs in the form of the front and the structure of the eyes. The front between the eyes is quadridentate as in *Ethusa*, but the basal segments of the antennules are very large and swollen, and occupy the whole width of the front and crowd back the eyes and antennae into an almost transverse position nearly beneath the outer orbital angles, which are reduced to small lateral teeth far back from the front. Eyestalks very small and immovably embedded in the orbits, which closely surround them to near the tips, except for a narrow space beneath. Only six branchiae on each side.

Atlantic, Pacific, and Indian Oceans. Deep water.

KEY TO THE AMERICAN SPECIES OF THE GENUS ETHUSINA

A¹. Front with four teeth or spines.
  B¹. Outer orbital tooth directed outward, not overreaching eye. **abyssicola** (p. 91)
  B². Outer orbital spine directed forward and overreaching eye.
    C¹. Outer orbital spine longitudinal, not reaching the line of the frontal sinuses ..... **smithiana** (p. 92)
    C². Outer orbital spine oblique, reaching beyond the line of the frontal sinuses ..... **gracilipes** (p. 94)
A². Front sinuate at middle and with a short outer spine. Carapace twice as wide as fronto-orbital distance ..... **faxonii** (p. 93)

TABLE 26.—*Material examined of* Ethusa tenuipes

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
FLORIDA:	° ′ ″	° ′ ″			F.°						
Off Miami	In Gulf Stream		25			Nov. 1915		J. B. Henderson	1 ♀	66816	
Sand Key			82			May 1913		do	1 ♀	46061	
S. of Sand Key Light	In Gulf Stream		60					do	1 ♂	66818	
Off Key West			110					do	1 ♂ 1 ♀	66817	
Do	24 25 30	81 47 45	50		74	Jan. 15, 1885	2316	*Albatross*	1 ♂	19855	Holotype.
Do						1893	39	State Univ. Iowa Bahama Exped.	{2 ♂ / 1 ♂	20030 / S.U.I.	
Off Key West and Sand Key.						do	27, 41, 47	do	3 ♂ 1 ♀	S.U.I.	
S. of Key West	In Gulf Stream, near edge of Pourtales Plateau.		90	Coral fragments				J. B. Henderson	1 ♂	66819	
Sambo Key, near Key West.			118					do	1 ♀ ovig	66820	
Tortugas			45			July 22, 1924	43	W. L. Schmitt	1 ♀ ovig	66815	Gift of Carnegie Institution.
Do	S. of Loggerhead Key, no. 2 red buoy.		40			Aug. 4, 1931		Longley and Manter	2 ♀ juv	71364	Do.
ALABAMA: S. of Mobile Bay; E. of Delta of the Mississippi.	29 24 30	88 01 00	35	yl. S. bk. Sp		Mar. 4, 1885	2388	*Albatross*	1 ♂	10061	

TABLE 27.—*Material examined of* Ethusa ciliatifrons

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
PANAMA:	° ′ ″	° ′ ″			° F.						
Bay of Panama	7 40 00	79 17 50	127	fne. gy. S	56.2	Mar. 8, 1891	3387	*Albatross*	1 ♂ y.	20629	
Do	7 33 40	79 43 20	153	gn. M	55.8	Mar. 9, 1891	3391	do	1 ♂ ly.	20630	Paratypes.
Do	7 32 00	78 36 30	259	hrd. gy. M. S.	47.4	Mar. 11, 1891	3396	do	1 ♂	19862	
Do	7 16 45	79 56 30	210	gn. M	48.8	Mar. 9, 1891	3389	do	5	4498, M. C. Z.	1 is holotype.

ANALOGOUS SPECIES OF ETHUSINA ON OPPOSITE SIDES OF THE CONTINENT

ATLANTIC	PACIFIC
abyssicola.	*smithiana.*

***ETHUSINA ABYSSICOLA* Smith**

FIGURE 21; PLATE 26, FIGURE 1; PLATE 27, FIGURE 1

Ethusina abyssicola SMITH, Rept. U. S. Comm. Fish and Fisheries for 1882, p. 349 [5], pl. 2, fig. 1, 1a, 1884 (type locality, off Nantucket Shoals, 1,731 fathoms; types U.S.N.M. no. 7119, and in P.M.Y.U.); *ibid.*, for 1885, p. 635 [31], 1886.—BOUVIER, Bull. Soc. Philom. Paris, ser. 8, vol. 9 (1896–1897), p. 66 [13], 1898; Résultats de campagnes scientifiques . . . Monaco, vol. 62, p. 53, pl. 2, fig. 1 (col.), 1922.—A. MILNE EDWARDS and BOUVIER, Crustacés décapodes provenant des campagnes du yacht l'*Hirondelle* (supplement) et de la *Princesse-Alice*, fasc. 13, p. 18, 1899; Expéditions-scientifiques du *Travailleur* et du *Talisman*, 1880–1883, pt. 1, Crustacés, Décapodes, p. 29, pl. 1, fig. 6 (col.), 1900.

Ethusa (*Ethusina*) *abyssicola* DOFLEIN, Wissenschaftliche Ergebnisse der deutschen Tiefsee-Expedition . . . *Valdivia*, 1898–1899, vol. 6, p. 31, pl. 13, figs. 1, 2, 1904.

Ethusina abyssicola typica IHLE, Zool. Anz., vol. 46, p. 360, 1916; Die Decapoda Brachyura der *Siboga*-Expedition, monogr. 39b[1], p. 147, 1916.

Diagnosis.—Outer orbital tooth directed outward, not overreaching eye. Dactyl of second ambulatory sensibly longer than that of first.

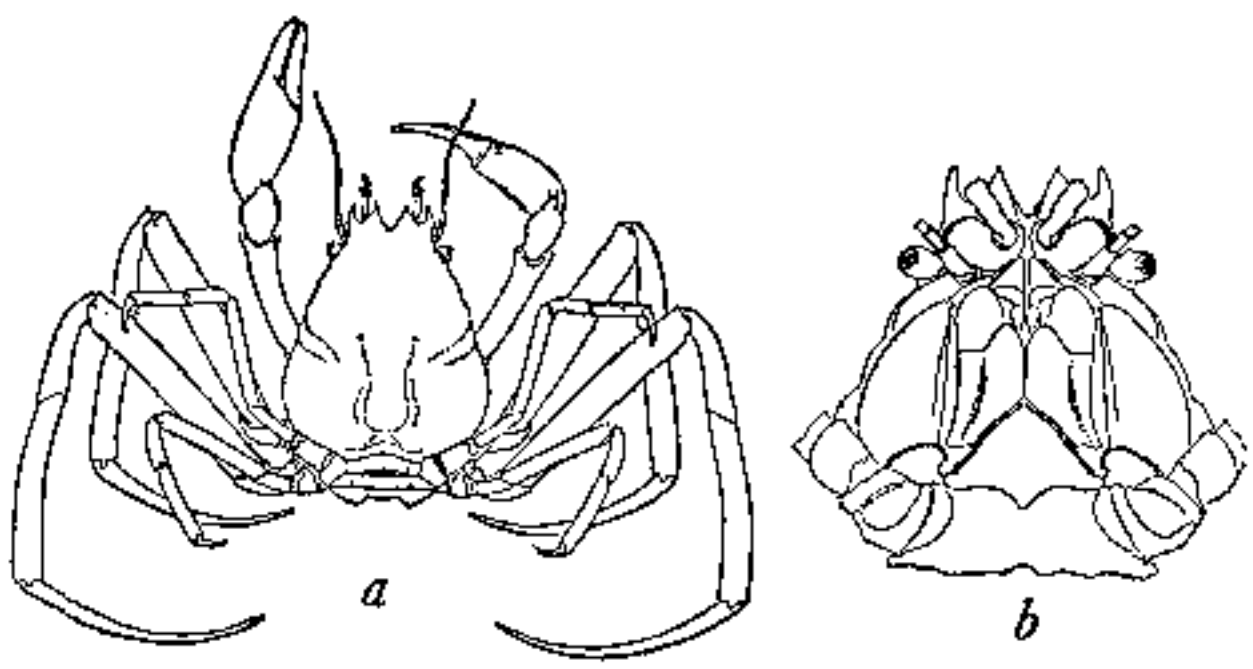


FIGURE 21.—*Ethusina abyssicola*, male: *a*, Dorsal view, natural size; *b*, front and oral region, ×2. After Smith.

Description.—Male. Carapace at branchial regions as broad as the length to middle of front, but much narrowed anteriorly, the breadth of front being about three-eighths of length. Submedian teeth of front triangular, slightly upturned and separated by a triangular sinus broader and deeper than the rounded antennular sinuses, while the lateral teeth are spiniform and longer than the middle teeth but more strongly upturned, so that they scarcely project in front of them. Surface of carapace pubescent, granulate, and areolated similar to *Ethusa microphthalma*, the cardiac region being broadly open in front. Eyestalks stout, reaching very slightly beyond the minute postorbital teeth, and bearing at the tips black eyes much smaller than the diameter of the stalks.

Chelipeds nearly equal, smooth, naked, unarmed, and much less than twice the length of carapace; merus about one-third the entire length, slender and somewhat 3-sided, but without angles; carpus short and rounded above; propodus nearly one-third as broad as long, basal portion somewhat swollen and about as long as the digits, which are compressed, longitudinally grooved, prehensile edges undulate. First and second ambulatories nearly alike, second the longer, about twice the length of chelipeds, slender, smooth and nearly naked. Dactyli much longer than propodi, compressed, regularly curved, of nearly uniform breadth to the short, acute tip and longitudinally grooved. Third and fourth pairs of legs very slender, pubescent.

The abdomen is broadest at base of third normal segment which has a smooth rounded tubercle on either side; third to fifth segments fused; penult segment about one-half broader than long, terminal segment nearly as long as the preceding, broader than long, rounded at tip. Appendage of first segment stout and pubescent near extremity, which is obliquely truncate; it sheathes the appendage of second segment which is much longer, the exposed terminal portion being thin, linear, and acuminate.

Female. Compared to male, carapace broader, thicker, much more convex; front narrower and armed with much smaller teeth; chelipeds smaller, chelae more slender.

Color.—Carapace bluish with a slight violet tint. Feet and abdomen yellowish white; fingers and ambulatory dactyls rose color. (Milne Edwards and Bouvier.)

Measurements.—Male (7119), length to tip of submedian spine 15, width 13.2 mm.

Range.—Off southern New England to Gulf of Mexico; Brazil; eastern Atlantic Ocean; 671 to 2,220 fathoms.

Material examined.—See table 28, p. 95.

ETHUSINA SMITHIANA Faxon

FIGURE 22; PLATE 26, FIGURE 2; PLATE 27, FIGURE 2

Aethusina smithiana FAXON, Bull. Mus. Comp. Zool., vol. 24, p. 160, 1893 (type locality, off Panama, 134 and 899 fathoms; types, U.S.N.M. no. 20631 and M. C. Z. no. 4503); Mem. Mus. Comp. Zool., vol. 18, p. 37, pl. 6, figs. 2, 2a, 1895.

Diagnosis.—Outer orbital spine directed forward, overreaching the eye. Dactyls of first and second ambulatories subequal.

Description.—Carapace longer than broad, not much narrowed anteriorly. Front 4-toothed, middle pair of teeth large, triangular, separated from one another by a wide triangular sinus which is broader than the antennular sinus; between these teeth the margin is bent down till it meets the epistome below; lateral teeth of front

spiniform and shorter than middle teeth. Surface of carapace clothed with a short pubescence and lightly granulous; branchiocardiac grooves well marked. Postocular teeth spiniform, projecting far beyond extremity of the small eyestalks. Eyes smaller than the extremity of their peduncles. Chelipeds equal, smooth, naked, unarmed; merus cylindrical, carpus short and rounded; fingers about equal in length to body of chela, compressed, prehensile edges sharp and not provided with distinct teeth or tubercles. Ambulatory legs nearly naked, second pair more than twice the length of carapace,

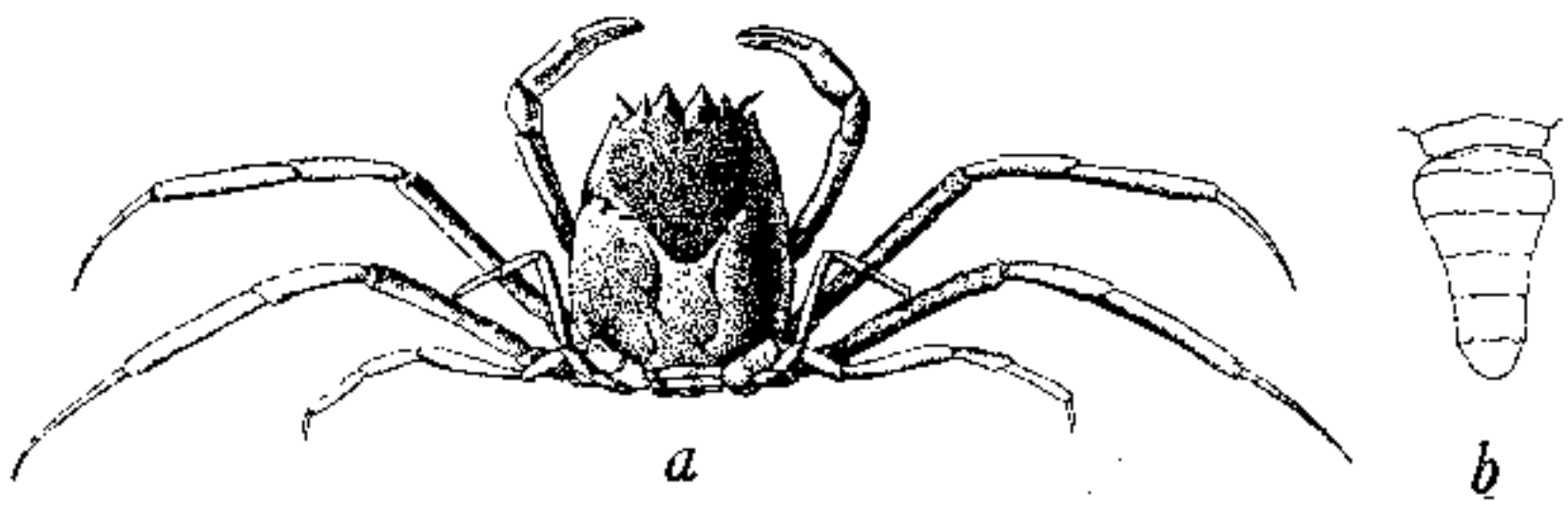


FIGURE 22.—*Ethusina smithiana:* *a*, Dorsal view, enlarged; *b*, male abdomen. After Faxon.

the dactylus longer than propodus. The last two pairs of legs terminate in short recurved claws which are setose on posterior edges. (Faxon.)

Measurements.—Male type (20631), length of carapace 9.3, breadth 8 mm.

Range.—Pacific side of Costa Rica, Panama, and Colombia.

Material examined.—As follows:

Off Costa Rica: Lat. 5° 36′ 40″ N., long. 86° 56′ 50″ W.; 134 fathoms; R. Sh.; 54.8° F.; February 28, 1891; station 3370, *Albatross;* 3 female paratypes (M. C. Z. no. 4503).

Off Colombia: Southeast of Malpelo Island; lat. 4°03′00″ N., long. 81°31′00″ W.; 899 fathoms; R.; 37.2° F.; March 5, 1891; station 3380, *Albatross;* 1 male, 1 immature female (20631.)

ETHUSINA FAXONII Rathbun

PLATE 26, FIGURE 3; PLATE 27, FIGURE 3

Ethusina challengeri? FAXON, Mem. Mus. Comp. Zool., vol. 18, p. 36, 1895; not *Ethusa* (*Ethusina*) *challengeri* Miers, Voyage of H. M. S. *Challenger*, Brachyura, vol. 17, p. 331, pl. 28, fig. 2–2c, 1886.

Ethusina faxonii RATHBUN, Proc. Biol. Soc. Washington, vol. 46, p. 185, 1933 (type locality, west of Mexico, 2,232 fathoms; M. C. Z. no. 4502).

Diagnosis.—Carapace as broad as long. Palm with upper and lower margins subparallel. Fingers slightly wavy on inner margin.

Description.—Carapace very convex longitudinally and transversely. Frontal teeth shallow, middle pair broad, obtuse, separated by a broad V-shaped sinus, slightly rounded at base; outer pair of teeth small, triangular, shorter than median teeth. Exorbital tooth

minute. Chelae slenderer than in *challengeri*, lower margin concave until near proximal end of manus; manus of nearly equal width throughout. Fingers longer than in the related species. Third and fourth ambulatories slenderer than in *challengeri*. Abdomen of female broader in distal half than in that species, inner distal angle of ischium of outer maxillipeds more salient and merus more pear-shaped.

Measurements.—Female type, length and breadth of carapace 12.5 mm.

Range.—Off west coast of Mexico.

Material examined.—South of Gulf of Tehuantepec; lat. 10°14′00″ N., long. 96°28′00″ W.; 2,232 fathoms; gn. M.; 35.8° F.; April 8, 1891; station 3414, *Albatross*; 1 female (M. C. Z. no. 4502).

ETHUSINA GRACILIPES (Miers)

PLATE 30, FIGURE 4; PLATE 31, FIGURE 4

Ethusa (*Ethusina*) *gracilipes* MIERS, Voyage of H. M. S. *Challenger*, Brachyura, vol. 17, p. 332, pl. 29, fig. 1 [not pl. 28, fig. 3], 1886 (type locality, near the Philippines, 700 fathoms; type in British Mus.).—ALCOCK, An account of the deep-sea Brachyura collected by the Royal Indian Museum Survey Ship *Investigator*, p. 34, 1899.

Ethusa (*Ethusina*) *gracilipes* var. *robusta* MIERS, *ibid.*, p. 333, pl. 29, fig. 2 (type locality, Banda Sea, 1,425 fathoms; type in British Mus.).

Aethusina gracilipes FAXON, Mem. Mus. Comp. Zool., vol. 18, p. 36, 1895.

Ethusina gracilipes RATHBUN, Bull. U. S. Fish Comm. for 1903, vol. 23, pt. 3, p. 891, 1906.

Diagnosis.—Outer orbital spine oblique, much longer than frontal spines and sometimes overreaching them. Basal article of antennules bearing a small distal spine or tubercle.

Description.—Carapace finely and closely granulated, longer than broad, narrowed anteriorly; cervical and cardiaco-branchial sutures distinctly defined; front armed with four spines, the two median separated by a somewhat wider and deeper interspace than that between the median and the outer spine; outer orbital spine strongly developed; orbits incompletely defined. Eyestalks stout, tapering to a small cornea. Bases of antennules considerably dilated and usually bearing a small distal spine or tubercle. Basal article of antennae short, slender, not nearly reaching front; flagellum elongated, reaching when retracted to posterior margin of carapace. Chelipeds with merus subcylindrical, carpus very short, palm but little longer than carpus, slightly compressed and shorter than the fingers, which are grooved and meet along the slightly sinuous edges; tips crossing. The compressed dactyli of the first and second ambulatories are deeply grooved, the second longer than the first and both longer than their respective meri.

TABLE 28.—*Material examined of* Ethusina abyssicola

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″			° F.						
NEW ENGLAND:											
SE. of Georges Bank	39 54 00	67 05 30	1813	Glob. Oz	36.8	Sept. 1, 1885	2570	*Albatross*	1 ♂	10799	
200 mi. SE. of Marthas Vineyard.	39 15 00	68 08 00	1781	gy. Oz	36.9	Aug. 31, 1885	2568	do	1 ♀	10798	
Off Nantucket Shoals	38 53 00	69 23 30	1731	Glob. Oz	38	July 18, 1883	2037	do	2 ♂ 1 ♀	7119	Cotypes.
Do	38 52 40	69 24 40	1735	Glob. Oz	38	do	2036	do	1 y. ♀	7118	
S. of Marthas Vineyard	38 29 30	70 54 30	1753	br. Oz		Sept. 18, 1886	2715	do	1 ♂	11949	
Do	38 22 00	70 17 30	1825	br. Oz		Sept. 17, 1886	2714	do	1 ♂	11948	
Do	38 20 00	70 08 30	1859	br. Oz		do	2713	do	3 ♀	11947	
VIRGINIA:											
E. of	37 50 00	73 03 50	1395	Glob. Oz	41	Nov. 6, 1883	2105	do	1 ♂	11340	
Do	37 25 00	73 06 00	1582	br. M	36.8	Sept. 11, 1884	2228	do	1 ♀	8565	
Off Chesapeake Bay	37 00 00	71 54 00	2045	Glob. Oz	36.8	Sept. 10, 1884	2226	do	1 ♂	8566	
NORTH CAROLINA: E. of Currituck Sound.	36 47 00	73 25 00	1641	gy. Oz. For		Oct. 23, 1886	2724	do	1 ♂	12282	
LOUISIANA: Off Delta of Mississippi.	28 51 00	88 18 00	730	gy. M	40.1	Mar. 3, 1885	2385	do	1 ♀	9083	
	Latitude S.										
BRAZIL: Off Cape Frio	24 17 00	42 48 30	671	br. Glob. Oz	37.9	Dec. 30, 1887	2763	do	1 sm. ♀	22151	
	Latitude N.										
EUROPE: West of Spain	42 15 00	23 37 00	2174–2220			Aug. 24, 1883		*Talisman*	1 ♀ 1 ♂	22939 6554, M. C. Z.	

Remarks.—Faxon says of the American specimens that in most of them the spine at the external angle of the carapace is long as in Miers' typical form, but is bent outward at a sharper angle, as in his var. *robusta*. The outer spine of front is longer in proportion to inner spine and the carapace rather narrower. Legs shorter, while the chela is midway in form between typical *gracilipes* and var. *robusta*.

Color.—Carapace and limbs covered with an extremely short brownish or whitish pubescence.

Range.—Pacific coast of Central America; Hawaiian Islands; western Pacific and Indian Oceans, 257 to 1,823 fathoms.

Material examined.—See table 29, page 97.

Genus CYMONOMUS A. Milne Edwards

Cymonomus A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 26, 1880 (type, *C. quadratus* A. Milne Edwards).—A. MILNE EDWARDS and BOUVIER, Crustacés décapodes provenant des campagnes du yacht l'*Hirondelle*, fasc. 7, p. 57, 1894; Mem. Mus. Comp. Zool., vol. 27, p. 80, 1902.—BOUVIER, Bull. Soc. Philom. Paris, ser. 8, vol. 9, p. 59, 1898.—LANKESTER, Quart. Journ. Micr. Soc., new ser., vol. 47, pp. 439, 453, 1903.—IHLE, Die Decapoda Brachyura der *Siboga*-Expedition, monogr. 39b[1], p. 118, 1916.

Carapace squarish, not concealing the anterior segments of the abdomen. Regions faintly defined except cardiac and postgastric, which are very distinct. The front forms a rostrum and the orbito-antennal border is prominent beyond the anterolateral angles of the carapace; apart from this there is no indication of orbits or antennular fossae. Eyestalks either fixed or with their mobility diminished; eyes unpigmented and vestigial. Antennules large, unconcealed; antennal peduncle not hidden and its renal tubercle particularly prominent. Buccal cavern large and square, its roof high and not well differentiated from the receding epistome. The external maxillipeds almost cover the buccal cavern ventrally, extending beyond base of antennal peduncle; merus produced far beyond carpal articulation so that it is not much shorter than the ischium; flagellum large, coarse and completely exposed. No afferent branchial fissure. Chelipeds equal, much shorter, and in male stouter than the crawling legs. First and second pair of true legs very long, especially the dactylus, and are somewhat compressed; third and fourth pair short, dactyli clawlike; not chelate. All segments of abdomen distinct. (After Alcock.)

Caribbean region; eastern North Atlantic; Indian and western Pacific Oceans.

TABLE 29.—*Material examined of* Ethusina gracilipes

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″			°F.						
PANAMA: Bay of Panama	6 10 00	83 06 00	1,471	gn. Oz	36.6	Feb. 25, 1891	3361	*Albatross*	1 ♀	20632	
COLOMBIA: Off southern	2 35 00	83 53 00	1,823	gn. Oz	36.4	Mar. 3, 1891	3374	do	5 ♂ ♀	4500, M. C. Z	
ECUADOR:											
Off northern	1 07 00	80 21 00	1,573	gn. Oz	36	Mar. 23, 1891	3398	do	2 ♂	4501, M. C. Z	
Off Galapagos Islands	2 34 00	92 06 00	1,360	Glob. Oz. dk. Sp	36	Apr. 5, 1891	3413	do	2 ♂ 1 ♀	20635	
	Latitude S.										
Do	0 04 00	90 24 30	885	Glob. Oz	37.2	Apr. 3, 1891	3407	do	1 ♀	20634	
E. of Galapagos Islands	0 36 00	86 46 00	1,322	lt. gy. Glob. Oz	36.1	Mar. 27, 1891	3400	do	2 ♀	20633	
HAWAIIAN ISLANDS:	*Latitude N.*										
S. coast of Oahu	Diamond Head Light, N. 31°, E. 5.3′.		308–322	fne. wh. S. M	43.5	May 5, 1902	3969	do	1 ♂	29032	
Vicinity of Kauai	Ukula Point, S. 82°30′, E. 10.2′.		444–478	gy. S. Glob	40	June 24, 1902	4028	do	1 ♀	29033	
Do	Hanamaulu warehouse, S. 37°, W. 27′.		257–312	fne. gy. S. M	46.8	Aug. 1, 1902	4132	do	1 ♂	29034	

TABLE 30.—*Material examined of* Cymonomus quadratus

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″			°F.						
GULF OF MEXICO: NW. of Tortugas.	26 53 00	84 21 00	101		61¾	1877–78	45	*Blake*	1	6681, M. C. Z	Figured.
CUBA:											
Off San Antonio			447	S. M		Feb. 10, 1872	3	Wm. Stimpson	1	3003, M. C. Z	
Off Habana	22 09 30	82 11 30	242			1877–78	58	*Blake*	1	2927, M. C. Z	Cotype.
Off Santiago de Cuba	19 55 46	75 49 23	400	bu. M. fne. S	49½	Feb. 27, 1884	2128	*Albatross*	1 ♀	6921	Soft shell.
PUERTO RICO: N. of	18 32 00	66 21 15	260			Feb. 4, 1933	23	Johnson-Smithson. Exped.	1 ♂	68094	
LESSER ANTILLES:											
Off St. Croix	Off Fredericksted		508	very sft. gy. Oz	42½	1878–79	136	*Blake*	1	6682, M. C. Z	Cotype.
Off Guadeloupe			175		55	do	167	do	1 ♀ ovig	68294	Cotype.
Off Dominica			372	fne. S. bk. M	43	do	188	do	1	2618, M. C. Z	Cotype.
Off St. Vincent			464		41½	do	230	do	1	2636, M. C. Z	
Off Grenada			291	fne. gy. Oz	47	do	291	do	1	2746, M. C. Z	Cotype.

CYMONOMUS QUADRATUS A. Milne Edwards

FIGURE 23; PLATE 30, FIGURE 3; PLATE 31, FIGURE 3

Cymonomus quadratus A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 26, 1880 (type localities, from Havana to Grenada, 175–508 fathoms; cotypes in M. C. Z.).—BOUVIER, Bull. Soc. Philom. Paris, ser. 8, vol. 9, p. 66 [13], 1898.—A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 27, p. 81, pl. 16, 1902.—LANKESTER, Quart. Journ. Micr. Soc., new ser., vol. 47, pp. 448, 453, fig. 10 (upper), 1903.

Diagnosis.—Carapace squarish, rostrum linear, eyestalks long, without cornea. Merus of outer maxilliped elongate, the palp attached at middle of inner margin.

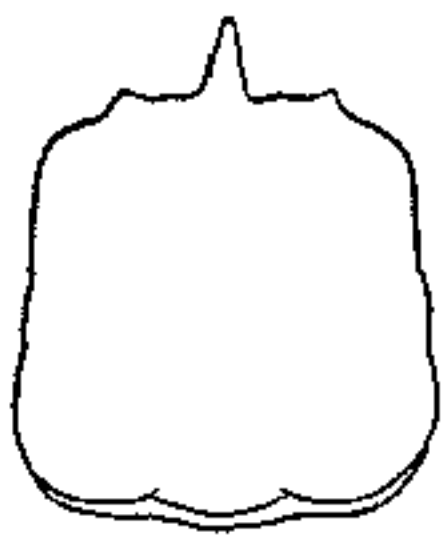


FIGURE 23.—*Cymonomus quadratus*, male (68004): Outline of carapace, × 3.

Description.—Surface finely granulate. Anterolateral borders of carapace almost on the same transverse line as the facial region, which is very narrow. Rostrum slender and pointed, shorter than eyestalks; the latter are partially movable and denticulate on inner border; they do not reach the tip of the antepenult article of antennal peduncle. Antennules stout, the peduncle about two-thirds as long as carapace. Antennae shorter and slenderer; the peduncle does not reach beyond the penult article of the antennules; subantennal tooth visible in dorsal view. Anterolateral margins armed with some small spines, posterolateral unarmed and parallel; posterior margin broad. Chelipeds short, granulate; two spinules on inner margin of carpus; fingers as long as palm. Ambulatory legs of first two pairs smooth.

Measurements.—Female (6921), length of carapace to tip of rostrum 7.2, width 6.9 mm.

Range.—Gulf of Mexico to Lesser Antilles; 101 to 508 fathoms.

Material examined.—See table 30, page 97.

Genus CYMOPOLUS A. Milne Edwards

Cymopolus A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 27, 1880 (type, *C. asper* A. Milne Edwards).—BOUVIER, Bull. Soc. Philom. Paris, ser. 8, vol. 9, p. 66 [13], 1898.—A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 27, p. 74, 1902.

Near *Cymonomus;* differs in its eyes normally developed, merus of outer maxilliped not overreaching palp, antennules smaller and

susceptible of being folded under the front and by the shorter and stronger feet.

Gulf of Mexico to Leeward Islands; 70 to 300 fathoms.

KEY TO THE SPECIES OF THE GENUS CYMOPOLUS

A¹. Sides of carapace nearly parallel. Cornea black..... asper (p. 99)
A². Carapace widest in front of middle. Cornea light brown.. agassizii (p. 100)

CYMOPOLUS ASPER A. Milne Edwards

PLATE 29, FIGURES 5–8

Cymopolus asper A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 27 (part), 1880 (type locality, Montserrat, 148 fathoms; type in M. C. Z.).—BOUVIER, Bull. Soc. Philom. Paris, ser. 8, vol. 9, p. 66 [13] (part), 1898.—A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 27, p. 74, pl. 14, figs. 1–6, pl. 15, fig. 7, 1902 (not all synonymy).

Diagnosis.—Sides of carapace nearly parallel. Cornea black. Merus of outer maxillipeds subquadrilateral, inner margin twice as long as outer.

Description.—Carapace thick, sides nearly parallel, surface covered with numerous spines of different sizes and very often bent in a hook at the end. Branchial suture very narrow, cervical suture wider, continued on the sides. Cardiac area in the form of a vase, the neck joining the gastric pentagon, which includes the meso-, meta-, and urogastric lobes; this pentagon has convex borders toward the median line; it is very prominent in the wide part and gradually narrows to a point; it is covered with spines of medium size and dominated on either side by three conical prominences, two of which are epigastric and the third anteriobranchial. These prominences are covered with long and strong crowded spines; there are similar ones on outer part of epigastric lobe, at antero-external angle of carapace, and a little within this last one, that corresponds to a hepatic lobe. This last belongs on the inclined part where the carapace is directed vertically downward to form the pterygostomian region. These regions, as well as the flanks and almost the whole of the branchial area, are armed with stronger spines than those on the cardiac region and the gastric pentagon. There are especially strong spines on the pterygostomian region outside the anterior border of the endostome. Some sparse hairs among the carapace spines. Rostrum triangular, concave above, strongly deflexed; behind the eyes the margins show on each side a strong conical prominence of large spines; in front a series of six or seven strong, arcuate, marginal spines on each margin besides the terminal spine. Below, the rostrum is convex and presents the form of a roof with two sides, the edge of which has two strong spines directed backward; these spines conceal the point where the rostrum is attached to the epistomian region.

Ocular peduncles short, stout at base, gradually narrowing to the black cornea; surface partly granulous, some spines on the summit. The antennules can fold wholly under the front; when so placed their second article is inside the eyes, parallel to frontal border, concealing the last peduncular article which is folded below it. Basal article in form of a rectangle rounded behind; armed inferiorly with numerous spinules, especially forward; it is almost in contact, on median line, with the corresponding article of the opposing antennule. First article of antennae entirely smooth, appearing to be a prominence of the epistome; next article elongate-quadrangular and a little bent; it has a strong spine at antero-external angle and on its lower surface a number of spinules; flagellum scarcely longer than second article; it is composed of three or four articles, the last furnished with two hairs longer than the whole flagellum. Ambulatory legs 1 and 2 covered with many strong spinules; at their base sometimes 3 or 4 arranged in a group. (*After Milne Edwards and Bouvier*).

Measurements.—Male holotype, length of carapace (rostrum incomplete) 8.5, width 6.5 mm.

Range.—Leeward Islands.

Material examined.—Off Montserrat; 148 fathoms; stony; station 158; *Blake*, 1878–79; 1 male holotype (M. C. Z. no. 6684).

CYMOPOLUS AGASSIZII A. Milne Edwards and Bouvier

PLATE 30, FIGURE 2; PLATE 31, FIGURE 2

Cymopolus asper A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 27, 1880 (part).—RATHBUN, Bull. Lab. Nat. Hist. State Univ. Iowa, vol. 4, p. 293, 1898.

Cymopolus agassizii [*agassirii*] A. MILNE EDWARDS and BOUVIER, Bull. Mus. Hist. Nat., Paris, vol. 5, p. 385, 1899 (type locality, Sand Key, 75 fathoms; type, male, M. C. Z. no. 6683).

Cymopolus agassizi A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 27, p. 78, pl. 14, figs. 7–9 [15]; pl. 15, figs. 1–6, 1902.

Diagnosis.—Carapace widest in front of middle. Cornea light brown. Merus of outer maxillipeds suboval, outer margin arcuate, longer than inner.

Description.—Carapace widest at the middle, sutures very distinct; gastric pentagon reaching to a point on the basal half of the rostrum; cardiac region wide, prolonged on the posterior branchial areas. On the dorsal face of the carapace, most of the projections resemble large granules, but three or four are stronger and form conical prominences on each epigastric lobe; others become equally long and strong on the anterior lobe of the branchial area, and form there some obtuse spines or one or two more conical protuberances. The deflexed sides of the carapace are rough with obtuse and arcuate spines up to the

[15] The caption on pl. 14, "*Cymopolus asper Agassizii*", is a blunder.

anterolateral angle; these spines have a tendency to form fingerlike groups. Rostrum deflexed at base and elevated a little toward extremity; inferior spines short; the two basal prominences above consist of a strong obtuse spine accompanied by some smaller ones; behind the rostrum, a transverse depression of carapace.

Ocular peduncles longer than in *C. asper*, and with spines reduced; corneal surface small with light brown pigment.[16] Antennules barely concealed under rostrum; flagellum of antennae composed of five articles. Epistome shorter than in *C. asper*, terminated behind by a vertical palate, the median part of which forms a regular curve and has only a slight elevation. Feet garnished with obtuse spines of all sizes. Chelipeds strong and equal; chelae convex on both faces; fingers bent inward and downward from their base, granulate and with a narrow hiatus. Merus, carpus, and propodus of first two ambulatories stout; dactyl bent slightly inward and somewhat longer than propodus; the largest spines have a tendency to dispose in longitudinal lines on merus. The last two pairs of legs barely reach base of carpus of the preceding, and have a strongly falciform digit. Terminal article of male abdomen reduced, its lateral borders slightly convex inward.

Measurements.—Male (18684), length of carapace 8, width 7 mm. Female (18684), length 9, width 7.2 mm.

Range.—Florida Keys to Puerto Rico; 70 to 300 fathoms.

Material examined.—See table 31, page 102.

Genus CORYCODUS A. Milne Edwards

Corycodus A. Milne Edwards, Bull. Mus. Comp. Zool., vol. 8, p. 23, 1880 (type, *C. bullatus* A. Milne Edwards).—Alcock, Journ. Asiat. Soc. Bengal, vol. 65, p. 274, 1896.—A. Milne Edwards and Bouvier, Mem. Mus. Comp. Zool., vol. 27, p. 86, 1902.—Ihle, Die Decapoda Brachyura der *Siboga*-Expedition, monogr. 39b[1], p. 124, 1916.

Nasinatalis Stebbing, Ann. South Afr. Mus., vol. 6, p. 340, 1910 (type *N. disjunctipes* Stebbing).

Carapace subpentagonal, extraordinarily swollen and thick especially in front where the facial region represents the anterior angle of a pentagon. A considerable space between insertion of cheliped and that of the first ambulatory. The body seems truncate behind by reason of the very backward position occupied by the abdomen of *female, which covers only the last three segments of the sternum.* Antennules much reduced, completely retractile in orbital cavity where they are protected by the valvular peduncle of the antennae. Exognath short, surpasses a little the end of ischium of endognath; the first and second maxillipeds have short palps on the exopodite.

West Indies; South Africa; Sulu Sea.

[16] The type specimen has lost its pigment.

TABLE 31.—*Material examined of* Cymopolus agassizii

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
FLORIDA:	° ′ ″	° ′ ″			°F.						
Pourtales Plateau	24 16 00	81 22 00	About 200			June 27, 1893	56	State Univ. Iowa Bahama Exped.	1 ♀	18683	
American Shoal Light	Bearing N. by W. 10 mi.		About 100			do	51	do		S. U. I.	
Do	Bearing N. by W. ½ W. about 10 mi.		105-110			do	52	do		S. U. I.	
Do	Bearing N. by W. about 8 mi.		About 110			June 29, 1893	64	do	1 ♂ 2 ♀	18685	
Do	Bearing NE. by N. 8 mi.		70-80			do	62	do		S. U. I.	
Do	Bearing N. by E. ½ E. about 8 mi.		85-95			do	63	do	1 ♂ 2 ♀	18684	
Off Key West	Sand Key Light bearing NNW.		About 100			June 20, 1893	30	do		S. U. I.	
Do	Sand Key Light bearing NNW. about 5 mi.		About 90			June 21, 1893	35	do	2 ♂	18682	
Sand Key Light	Bearing N. about 6 mi.		116			June 19, 1893	28	do		S. U. I.	
Do	Bearing N. ½ W. about 6 mi.		About 105			June 20, 1893	33	do		S. U. I.	
Do	Distant 7 mi.		134			Mar. 29, 1872		Wm. Stimpson	1 ♀	3004, M. C. Z.	Paratype.
Off Sand Key			75					do	1 ♂	6683, M. C. Z.	Holotype.
Do			120					John B. Henderson	1 ♂	67433	
Off Sambo Key			135					do	1 ♂	67434	
Gulf Stream off Key West.	24 17 05	81 58 25	132	S	52	Feb. 14, 1902	7280	*Fish Hawk*	1 ♀ ovig.	67432	
Do	24 18 37	81 36 50	127	rky	58	Mar. 4, 1902	7301	do	1 ♀ ovig.	67431	
PUERTO RICO: W. of	18 03 45	67 48 10	240-300			Feb. 11, 1933	43	Johnson - Smithsonian Exped.	1 ♂	67825	

CORYCODUS BULLATUS A. Milne Edwards

PLATE 29, FIGURES 1–4; PLATE 30, FIGURE 1; PLATE 31, FIGURE 1

Corycodus bullatus A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 23, *1880 (type locality, off Morro lighthouse, 175–250 fathoms; whereabouts of* type unknown.).—A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 27, p. 86, pl. 17, 1902.

Diagnosis.—Carapace pentagonal, anterolateral border longer than posterolateral. A long distance between base of cheliped and of first ambulatory.

Description.—Carapace covered with tubercles flattened at tip, which tend to disappear on the median line and the rear, but are very prominent along the anterior borders. Regions scarcely marked except the cardiac region, which is small but limited by deep furrows, very divergent behind, closer in front. Anterolateral longer than posterolateral borders. Front very deflexed, its point bent between the eyes to join the epistome. Eyes small. Lower part of carapace, sternal plastron, and ambulatory legs covered with small tubercles like those on dorsal face. A strong prominence tipped with a spine on median line at base of external maxillipeds. A row of three *similar spines on basis and ischium of maxillipeds. A median promi*nence at base of cheliped. Subhepatic region excavate.

Merus of cheliped stout, subcylindrical, reaching to extreme line of lateral border. Merus of first ambulatory slender. Fourth leg very slender, not over half as long as carapace; merus longest, carpus very reduced, propodus straight, considerably longer than the curved dactylus.

Measurements.—Female (18061), median length of carapace 5, width 9, thickness at base of maxillipeds 4.6 mm.

Range.—Off Habana, Cuba.

Material examined.—Off Habana; lat. 23° 10′ 39″ N., long. 82° 20′ 21″ W.; 201 fathoms; Co.; January 19, 1885; station 2342, *Albatross;* 1 female (18061).

Type locality.—Off Morro lighthouse; 175–250 fathoms; 1878–79; station 101, *Blake;* 1 female (Paris Mus.).

Genus CYCLODORIPPE A. Milne Edwards

Cyclodorippe A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 24, 1880 (part).—A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 27, p. 94, 1902 (type, *C. agassizii* A. Milne Edwards).

Carapace narrow in front and behind, lateral borders regularly rounded, greatest width near the middle. Eyes very short and closely placed in the orbit, the edge of which is not fissured. Antennules very long and when folded cannot fit into the antennular cavity; antennal peduncles very narrow, flagella many-jointed. Buccal cavity prolonged in a canal which attains the level of the front and is divided almost to the extremity by the outer maxillipeds, the merus

of which is very elongate. Abdomen of male very small, composed of five segments, fitted into a deep opening in the sternum and not encroaching on the second sternal segment. Abdomen of female 6-segmented and wide with parallel borders; its last segment very large and advanced to the base of the chelipeds. Legs long and narrow; the genital orifices of the female are sunken in the basal article of the third pair of legs.

Gulf of Mexico, West Indies, and Indo-Pacific region; in deep water.

KEY TO THE SPECIES OF THE GENUS CYCLODORIPPE

A¹. Carapace with two low median tubercles. Three elongate gastric elevations ..... **antennaria** (p. 104)

A². Carapace with two median spines.

B¹. Median spines conical. A stouter spine on protogastric region ..... **agassizii** (p. 105)

B². Median spines cylindrical. No spine on protogastric region ..... **bouvieri** (p. 106)

CYCLODORIPPE ANTENNARIA A. Milne Edwards

FIGURE 24; PLATE 32, FIGURES 1, 2

Cyclodorippe antennaria A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 25, 1880 (type localities 20, ranging from Habana to Barbados, 88 to 287 fathoms).—BOUVIER, Bull. Soc. Philom. Paris, ser. 8, vol. 9, p. 66 [13], 1898.—RATHBUN, Bull. Lab. Nat. Hist. State Univ. Iowa, vol. 4, p. 293, 1898.—A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 27, p. 99, pl. 19, fig. 8, pl. 20, figs. 4-12, 1902.

Diagnosis.—Three low longitudinal prominences on gastric region, one median, the others lateral. Two low median tubercles, one gastric, one cardiac. Frontal border rounded, continuing in a regular curve with upper border of orbit. Upper margin of orbit transverse.

Description.—Carapace subcircular, narrow behind, covered with prominent, subequal granules. Furrows well marked; cardiac area

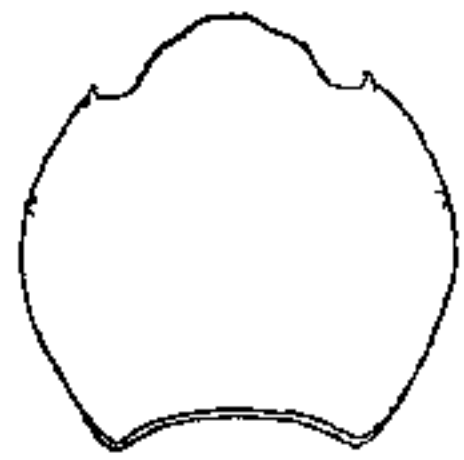


FIGURE 24.—*Cyclodorippe antennaria*, male (68294): Outline of carapace, × 4.

prominent, well defined behind and on the sides, merging with the posterior branchial area; in front it is completely fused with the urogastric lobe. Front advanced much beyond orbital angles, depressed on the median line, its border very finely serrulate. Postorbital angle spiniform; a small branchial spine just within the

lateral margin and slightly in advance of the widest part of the carapace. Ocular peduncles short and wide; the cornea occupies at least two-thirds of total length. The antennules are very long and slender and cannot entirely fold up under the front. The roof of the orbit is little advanced. Merus of outer maxilliped wider and more rounded in front than in *agassizii*.

Chelipeds of male short, granulous; arm scarcely projects beyond carapace; fingers very high, sharp edged, very finely denticulate and equal in length to palm. Ambulatory legs finely granulous, the first two pairs long and slightly compressed in their terminal part, the first pair with a fringe of long hair on the upper face of the three distal articles. Legs of last two pairs very slender and elongate.

Measurements.—Male (9498), length 5.7, width 5.8 mm. Female (9517), length 5.5, width 5.6 mm.

Range.—Gulf of Mexico; West Indies. 50 to 357 fathoms.

Material examined.—See table 32, page 107.

CYCLODORIPPE AGASSIZII A. Milne Edwards

FIGURE 25; PLATE 32, FIGURES 5, 6

Cyclodorippe agassizii A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 25, 1880 (type locality, Cariacou, 163 fathoms; type, M. C. Z. no. 6680).—BOUVIER, Bull. Soc. Philom. Paris, ser. 8, vol. 9, p. 66 [13], 1898.

Cyclodorippe agassizi A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 27, p. 94, pl. 19, figs. 1–7, pl. 20, figs. 1–3, 1902 (part).

Diagnosis.—Four conical prominences on carapace, one cardiac, one metagastric, two protogastric. Front triangular, having a lateral angle. Orbit wide in dorsal view, its margin directed obliquely backward from rostrum.

Description.—Carapace rounded on the sides, a little depressed above, covered with fine, unequal granules rather near together.

FIGURE 25.—*Cyclodorippe agassizii*, male (68071): Outline of carapace, × 3.

Rostrum wide, nearly horizontal and a little excavate, and limited in front by a denticulate border forming an obtuse angle; at the level of the base of the ocular peduncles the two sides are directed nearly parallel backward and at this point are more elevated than in front. Upper border of orbit smooth and directed obliquely backward, rising in a spiniform prominence at its outer extremity. A strong spine above lateral border slightly in front of widest point of carapace. Cardiac spine very large, embracing the entire region. Ocular pedun-

cles narrowed at middle; the corneal surface does not reach to the middle of the peduncle, although it extends much farther below than above and presents a very oblique inferior border. Basal article of antennules dilated especially toward the base and surpassing the rostrum; the two following articles very slender and of nearly equal length; flagella reduced; total length of antennules nearly equal to total length of carapace. Antennae extremely small, flagella very slender, barely reaching extremity of second article of antennular peduncles. Outer maxillipeds remarkable for length of ischium and exopodite, the latter dilated, ending in front at same level as the ischium.

Chelipeds well developed; palm short, swollen outside, especially below; fingers a little bent inward near the base and nearly twice as long as palm. Outer face of chela armed, except on fingers, with fine granules forming in places curved lines. Carpus short, granulous, armed inside with a spinulous lobe, and with a right angled outer line but no prominent tooth. Merus triangular, bordered with tubercles or denticles. The first ambulatory nearly surpasses the chela by the entire length of its dactyl; the second surpasses the first by a similar length. Last two pairs of feet very slender, reaching when straightened nearly to the eyes; dactyls arched, two-thirds as long as propodites.

Measurements.—Female (*Blake* station 238) total length of carapace 7.5, width 8 mm. (Milne Edwards and Bouvier.)

Range.—West Indies; 127 to 220 fathoms.

Material examined.—See table 33, page 108.

CYCLODORIPPE BOUVIERI Rathbun

PLATE 32, FIGURES 3, 4; PLATE 81, FIGURES 1, 2

Cyclodorippe agassizi A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 27 p. 94, 1902 (part).

Cyclodorippe bouvieri RATHBUN, Smithsonian Misc. Coll., vol. 91, no. 3, p. 1, pl. 1, 1934.

Type locality.—Northeast of Puerto Rico; 300 fathoms; Johnson-Smithsonian expedition; 1 male holotype (67990).

Diagnosis.—Differs from *C. agassizii* as follows: No spine on protogastric regions. Median spines tubular, higher than in *agassizii;* granulation coarser on carapace and cheliped. Rostrum arcuate. Orbit narrow in dorsal view, margin rounding, orbital spine smaller than in the allied form. Wrist with a prominent blunt outer tooth or spine near distal end and directed forward.

Measurements.—Male holotype, length of carapace 5.2, width 5.6 mm.

Range.—Off Cuba and Puerto Rico; 150 to 300 fathoms.

Material examined.—See table 34, page 108.

TABLE 32.—*Material examined of* Cyclodorippe antennaria

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″			° F.						
FLORIDA:											
W. of Charlotte Harbor.	26 31 00	85 53 00	119			1877–78	50	*Blake*	3	6674, M. C. Z.	1 figured.
Off Sand Key			50–60			1893	27	State Univ. Iowa Bahama Exped.		S. U. I.	
MEXICO: N. of Yucatan.	23 32 00	88 05 00	95			1877–78	32	do	1	2704, M. C. Z.	Cotype.
									5	2607, M. C. Z.	Cotypes.
CUBA											
Off Bahia Honda	23 02 30	83 11 00	220		62	do	20	do	2	2670, M. C. Z.	Cotypes.
Off Habana			242			do	53	do	1	6676, M. C. Z.	Cotype.
Do			175			do	54	do	1 ♂	68293	Cotype.
Do	23 10 39	82 20 21	201	Co		Jan. 19, 1885	2342	*Albatross*	1 ♀	9520	
Do	23 11 00	82 19 06	143	Co		do	2341	do	1 ♀	9517	
Do	23 11 45	82 17 54	182	fne. br. S.		Jan. 17, 1885	2327	do	2 ♂ 1 ♀	9498	
Do	23 10 54	82 17 45	115	Co		do	2322	do	2 ♀	9489	
Do						1893		State Univ. Iowa Bahama Exped.		S. U. I.	
Cuba?								Wm. Stimpson	1 ♂	4192, M. C. Z.	
Do	21 14 00		100			Apr. 22, 1872		do	2	3002, M. C. Z.	
PUERTO RICO: NE. of	18 45 40	64 48 00	300			Mar. 4, 1933	101	Johnson-Smithsonian Exped.	5 y.	67819	
LESSER ANTILLES:											
Dominica			138		63¾	1878–79	192	*Blake*	1	2604, M. C. Z.	Cotype.
Martinique			191	rough		do	210	do	1	2621, M. C. Z.	Cotype.
Do			357	fne. yl. S. brk. Sh.		do	211	do	1	6678, M. C. Z.	Variety.
St. Vincent			88		62	do	232	do	2	2587, M. C. Z.	Cotypes.
Barbados			209	fne S. Oz	53½	do	274	do	1 ♂	4456, M. C. Z.	
									1 ♀	68292	
Do			200	flat calc. St.	49¾	do	291	do	1	2770, M. C. Z.	Cotypes, including variations.
									1	4457, M. C. Z.	
									1	6675, M. C. Z.	Cotypes.
Do	Off Sandy Bay		100			Dec. 1871		*Hassler*	2	2585, M. C. Z.	
Grenadines			127	fne. co. S.	56	1878–79	238	*Blake*	1 ♀	4454, M. C. Z.	
Grenada			154	fne. gy. Oz	56	do	246	do	2	4455, M. C. Z.	

TABLE 33.—*Material examined of* Cyclodorippe agassizii

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
	° ′ ″	° ′ ″									
PUERTO RICO:											
N. of	18 30 30	66 04 05	200-300			Feb. 2, 1933	13	Johnson-Smithsonian Exped.	1 ♀	67809	
NE. of	18 40 00	64 51 00	220			Mar. 3, 1933	99	do	1 ♂ 1 y.	67808	
Do	18 40 15	64 50 15	150			Mar 4, 1933	100	do	4 ♂ 1 ♀	67810	
Do	18 51 00	64 33 00	140			do	102	do	2 ♂ 2 ♀ (1 ovig.)	68071	
LESSER ANTILLES:											
Off Carriacou, Grenadines.			163			1878-79	241	*Blake*	1 ♀	6680, M. C. Z.	Holotype.
Off Grenadines			127			do	238	do	1 ♂ 1 ♀	Paris Mus.	

TABLE 34.—*Material examined of* Cyclodorippe bouvieri

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
	° ′ ″	° ′ ″									
CUBA: Off Habana			242			1877-78	53	*Blake*	1 ♂	Paris Mus.	Not examined by author.
PUERTO RICO:											
NE. of	18 40 15	64 50 15	150			Mar. 4, 1933	100	Johnson - Smithsonian Exped.	1 ♂ 1 ♀ ovig.	67827	
Do	18 45 40	64 48 00	300			do	101	do	1 ♂	67990	Holotype.

Genus CLYTHROCERUS A. Milne Edwards and Bouvier

Clythrocerus A. MILNE EDWARDS and BOUVIER, Bull. Mus. Hist. Nat., Paris, vol. 5, p. 387, 1899 [type, *C. nitidus* (A. Milne Edwards)]; Mem. Mus. Comp. Zool., vol. 27, p. 99, 1902.—RATHBUN, Bull. U. S. Fish Comm. for 1900, vol. 20, pt. 2, p. 90, 1901.

Resembles *Cyclodorippe* in the rounded carapace, the mediocre sternal plastron, and the complete atrophy of the exopod of the anterior and intermediate maxillipeds. Differs in its small antennules, completely retractile in the orbito-antennal cavity, in the valviform peduncle of the very short antennae and the comparative shortness of the ambulatory legs.

East and west coasts of Middle America; Japan.

KEY TO THE SPECIES OF THE GENUS CLYTHROCERUS

A¹. Only one lateral tooth or spine behind the orbital tooth.
  B¹. Front with two teeth.
    C¹. Carapace thick, smooth, and shining..... **nitidus** (p. 109)
    C². Carapace flat, finely granulate.
      D¹. Carapace with an indentation either side of lateral tooth. **perpusillus** (p. 111)
      D². Carapace without marginal indentations. Carpus of male cheliped with a large inner plate..... **laminatus** (p. 115)
  B². Front with three teeth. Carapace and appendages densely granulate. Margins of carapace spinulous..... **granulatus** (p. 119)
A². Two lateral teeth or spines behind the orbital tooth.
  B¹. Distance between lateral spines greater than between foremost tooth and orbital tooth. Frontal teeth with short tips..... **planus** (p. 114)
  B². Distance between lateral spines less than between foremost tooth and orbital tooth.
    C¹. No spine above lateral spines. Two frontal teeth... **decorus** (p. 118)
    C². A spine above and between lateral spines. Three frontal teeth..... **stimpsoni** (p. 121)

CLYTHROCERUS NITIDUS (A. Milne Edwards)

FIGURES 26, 27; PLATE 33, FIGURES 1, 2

Cyclodorippe nitida A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 24, 1880 (type localities, Florida Keys and Grenada; cotypes in M. C. Z.).—S. I. SMITH, Bull. Mus. Comp. Zool., vol. 10, p. 7, pl. 2, figs. 1, 1b, 1882.—BOUVIER, Bull. Soc. Philom. Paris, ser. 8, vol. 9, p. 66 [13], 1898.—RATHBUN, Bull. Lab. Nat. Hist. State Univ. Iowa, vol. 4, p. 293, 1898.

Clythrocerus nitidus A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 27, p. 90, pl. 18, 1902.

Diagnosis.—Carapace and appendages smooth and shining. Only one lateral tooth or spine.

Description.—Carapace entirely smooth, thick, not swollen, slightly depressed transversely behind the front. Branchio-cardiac and urogastric sutures distinct. Front deeply depressed and with a broad V-shaped median sinus; its lateral angles are at the same level as the

dorsal face of the carapace and are advanced as two rostral teeth. Antennae short and folded under the front. A subspiniform tubercle on each side on the front part of the branchial region. A V-shaped notch in upper margin of orbit. Ocular peduncles with a deep rounded

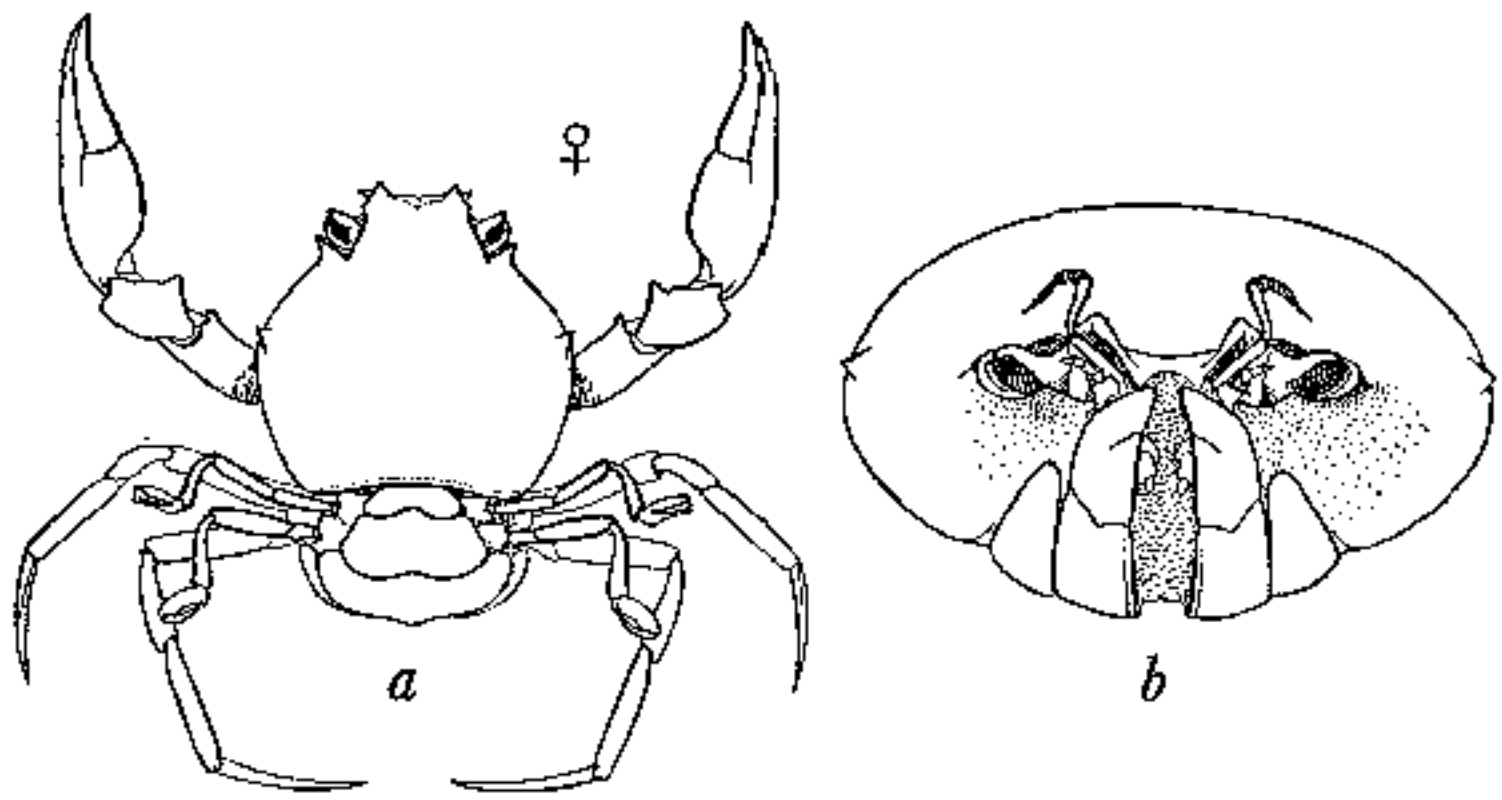


FIGURE 26.—*Clythrocerus nitidus*, female (M. C. Z.): *a*, Dorsal, ×3; *b*, front view, ×6. After Smith.

sinus above and dilated in corneal region, at the summit of which there is a slight, pointed tubercle. Chelipeds of male very large; arm smooth, much exceeding the carapace; carpus with a small obtuse tooth on inner margin; palm flat above and very thick; fingers shorter than palm, incurved, gaping in proximal half, some

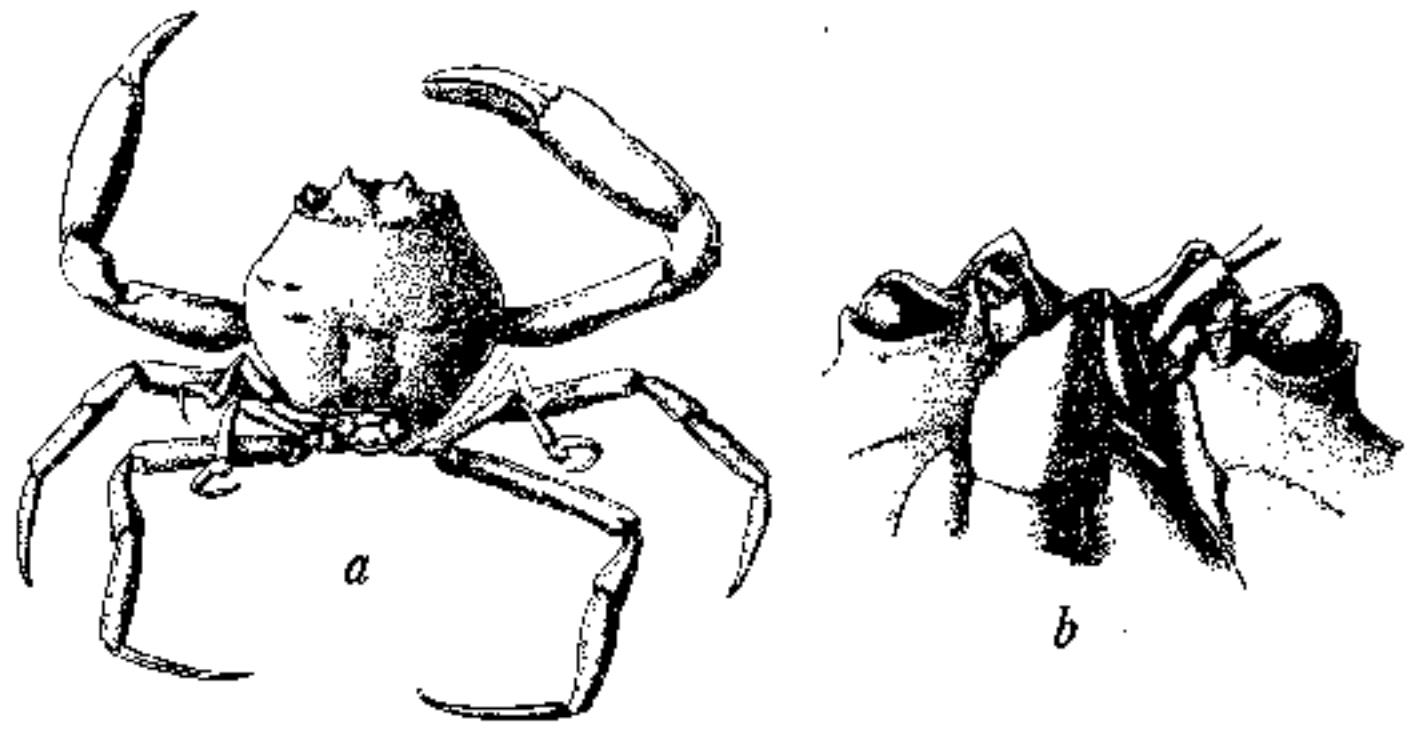


FIGURE 27.—*Clythrocerus nitidus*, male: *a*, Dorsal, ×2 (approx.); *b*, cephalic region, ventral (left maxilliped removed), ×7 (approx.). After A. Milne Edwards and Bouvier.

hairs on inner surface. Ambulatory legs rounded like the chelipeds, not flattened; smooth and ending in a dactyl slightly arcuate and styliform. The first leg reaches the middle of the palmar portion of cheliped and the middle of the dactyl of the following pair. The last two legs do not surpass the distal part of the merus of the preceding.

Measurements.—Male (66848), length of carapace to tip of spine 9.5, width 10.3 mm.

Range.—South Carolina to west Florida and Grenada; 6½ to 262 fathoms.

Material examined.—See table 35, page 112.

CLYTHROCERUS PERPUSILLUS Rathbun

FIGURE 28; PLATE 33, FIGURES 3, 4

Clythrocerus perpusillus RATHBUN, Bull. U. S. Fish Comm. for 1900, vol. 20, pt. 2, p. 90, fig. 14, 1901 (type locality, off Vieques, 15 fathoms; type, U.S.N.M. no. 23777); Bull. Lab. Nat. Hist. State Univ. Iowa, vol. 9, p. 66, 1921.

Diagnosis.—Carapace flat, finely granulate, margins pubescent. One lateral tooth and two indentations.

Description.—Carapace slightly broader than long, finely and closely granulate; regions slightly marked; surface flat, the front in the same plane; two triangular, blunt frontal teeth, separated by a sinus equal

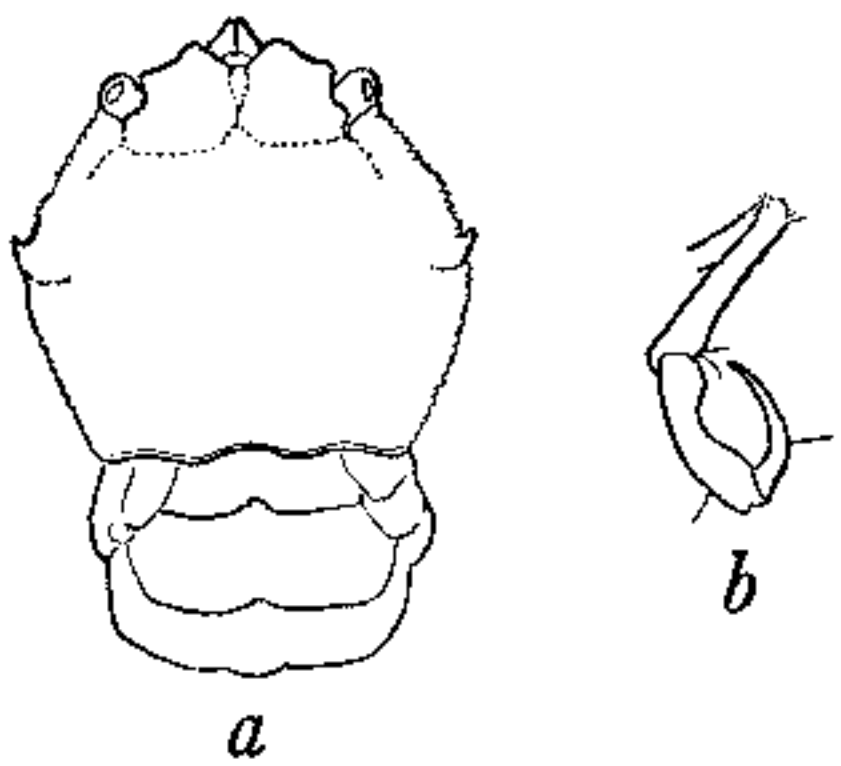


FIGURE 28.—*Clythrocerus perpusillus*, female (23777): *a*, Dorsal view, ×14 (approx.); *b*, extremity of fourth leg.

to the reverse of either of the teeth; emargination of orbit a quadrilateral obliquely placed; preorbital angle flat, inconspicuous; postorbital angle a little thickened, dentiform; the eye projects beyond line of orbit. A small, sharp spine, just before middle of lateral margin; a notch behind the spine; halfway between the spine and the orbital angle there is a slight indentation; lateral margins in front of spine fringed with a short pubescence, as are also the merus and carpus of the longer legs. Outer maxillipeds long, the merus joints projecting between the rostral teeth and visible in a dorsal view. Cheliped stout and short, about 1.5 times length of carapace; wrist with a prominent antero-external lobe; hand and movable finger with an inner superior crest; fingers bent strongly inward; thumb stouter than movable finger; they meet along their closing edges. The second pair of ambulatories exceeds the first by about the length of dactylus; both pairs slender and flat. Dactylus of last two pairs strongly curved and about as long as the curved propodus, against the base of which it fits.

Measurements.—Female type, length of carapace 2.2, width 2.5 mm.

Range.—Puerto Rico to Barbados.

TABLE 35.—*Material examined of* Clythrocerus nitidus

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″			°F.						
SOUTH CAROLINA: E. of St. Helena Sound.	32 25 00	77 42 30	262		45½	1880	319	*Blake*	1♀	3186, M. C. Z.	Figured by S.I. Smith.
FLORIDA:											
Fowey Rocks			95					John B. Henderson	1y	67444	
Do			75–90					do	2y	67445	
Ragged Key			75–90					do	1y	67443	
Off Sombrero Key.								*Bache;* Wm. Stimpson.	10+	3001, M. C. Z.	
Off American Shoal Light-House.	Bearing N. by W. 10 mi.		About 100.			June 27, 1893	51	State Univ. Iowa Bahama Exped.	60 5 ♂ 5 ♀	S. U. I. 18681	Compared with types.
Do	Bearing N. by W. ½ W. about 10 mi.		105–110			do	52	do	1 ♂	12101, S. U. I.	
Do	Bearing N.W. by N. ½ N. 15 mi.		About 130.			do	54	do	1 ♂ 2 ♀ (1 ovig.)	15193, S. U. I.	
Do	Bearing N.E. by N. 8 mi.		70–80			June 29, 1893	62	do	1 ♂	20453, S. U. I.	
Do	Bearing N. by E. ½ E. about 8 mi.		85–95			do	63	do	10	18249, S. U. I.	
Sand Key SE. by E.			75					John B. Henderson	1y	67442	
S. of Sand Key			85					do	1 ♂ 1 ♀	66835	
Off Sand Key			120					do	17 ♂ 18 ♀ (11 ovig)	66843	
Do			75			Mar. 29, 1872	1	*Bache;* Wm. Stimpson.	25+	2998, M. C. Z.	
Do			129					do	25+	2997, M. C. Z.	
Do			132			Apr. 1872		do	25+	3000, M. C. Z.	
Do	7 mi. S. by W.		111		55½	1877–78	9	*Blake*	10+	3057, M. C. Z.	Cotypes.
Pourtales Plateau.	24 16 00	81 22 00	About 200.			June 27, 1893	56	State Univ. Iowa Bahama Exped.	75+	11847 18248 S.U.I.	
Off Sambo Key, near Key West.			110					John B. Henderson	2 ♂ 3 ♀ (1 ovig.)	66837	
Do			115					do	2 ♀ ovig	66839	
Do			118					do	10 ♂ 14 ♀ (13 ovig)	66845	
Do			120					do	6 ♂ 8 ♀ (2 ovig.)	66834	
Do			135					do	4 ♂ 12 ♀ (8 ovig.)	66840	
Off Western Dry Rocks.			110					do	22 ♂ 35 ♀ (22 ovig.)	66842	

Do.			144					do	9 ♂ 13 ♀ (7 ovig.)	66844	
Off Key West			100–120					do	1 ♂	66838	
Do.			110					do	1 ♀	66841	
Do.	Sand Key Light bearing NNW.		About 100.			June 20, 1893	30	State Univ. Iowa Bahama Exped.	100+ 6 ♂ 6 ♀	11785, S. U. I. 18680	
Do.	Sand Key Light bearing NW. by N., Key West Light N. ½ E.		50–60			June 19, 1893	27	do	2 ♂ 3 ♀	S. U. I.	
Gulf Stream off Key West.	24 18 37	81 36 50	127	rky.	58	Mar. 4, 1902	7301	*Fish Hawk*	22 ♂ 30 ♀ (25 ovig.)	66847	
Do.	24 19 00	81 39 45	120	Co.	53.5	Feb. 26, 1902	7298	do	1 ♀ ovig	66832	
Do.	24 21 45	81 47 45	122	Co.	54	do	7296	do	2 ♂	66831	
Do.	24 21 15	81 52 15	109	S.	54.5	Feb. 19, 1902	7282	do	3 ♂ 4 ♀ (1 ♂ 2 ♀ soft shell.)	66846	
Do.	24 17 30	81 53 30	127	S. Gr.	53	do	7283	do	3 ♂ 6 ♀ (2 ovig., 3 soft shell.)	66849	
Do.	24 17 05	81 58 25	132	S.	52	Feb. 14, 1902	7280	do	3 ♂ 3 ♀ ovig	66848	
Do.	24 17 30	82 09 00	137			1877–78	6	*Blake*	1	2749, M. C. Z.	Cotype.
Do.	24 15 00	82 13 00	152–229	sft. Co. Oz.	49.5	do	5	do	1 ♀ 2 1	2767, M. C. Z. 6671, M. C. Z. 6672, M. C. Z.	Do. Do. Do.
NW. Passage to Key West.	5 mi. off breakwater		6½					John B. Henderson	1 ♀ ovig	66833	
Florida								do	1 ♂	66836	
W. Florida			42					*Bache*, Wm. Stimpson.	6	2999, M. C. Z.	
SW. of Cape San Blas.			25–27			Feb. 7, 1885	2369–2374	*Albatross*	1 y	19878	
Florida Keys						1893		State Univ. Iowa Bahama Exped.	40+	12106, S. U. I.	
LESSER ANTILLES: Grenada.	Off		164	Co. brk. Sh.	57	1878–79	254	*Blake*	1	2645, M. C. Z.	Cotype.

Material examined.—As follows:

Puerto Rico: Off Vieques; Culebritas lighthouse NE. ½ N., 10 miles; 15 fathoms; Co.; February 8, 1899; station 6091, *Fish Hawk*; 1 female, holotype (23777).

Barbados: 1 mile southwest of Pelican Island; 38 fathoms; fne. Co. frag.; May 13, 1918; station 1, Barbados-Antigua Expedition, State University of Iowa; 1 female, same size as type (S. U. I.).

CLYTHROCERUS PLANUS Rathbun

FIGURE 29; PLATE 34, FIGURES 1, 2

Cyclodorippe plana RATHBUN, Amer. Nat., vol. 34, p. 519, 1900.

Clythrocerus planus RATHBUN, Harriman Alaska Expedition, vol. 10, p. 168, pl. 9, fig. 4, 1904 [type locality, southern California at Catalina Harbor (probably); type, U.S.N.M. no. 14256].

Diagnosis.—Carapace finely and appendages coarsely granulate. Two lateral teeth or spines, the distance between them greater than between the foremost tooth and the orbital tooth.

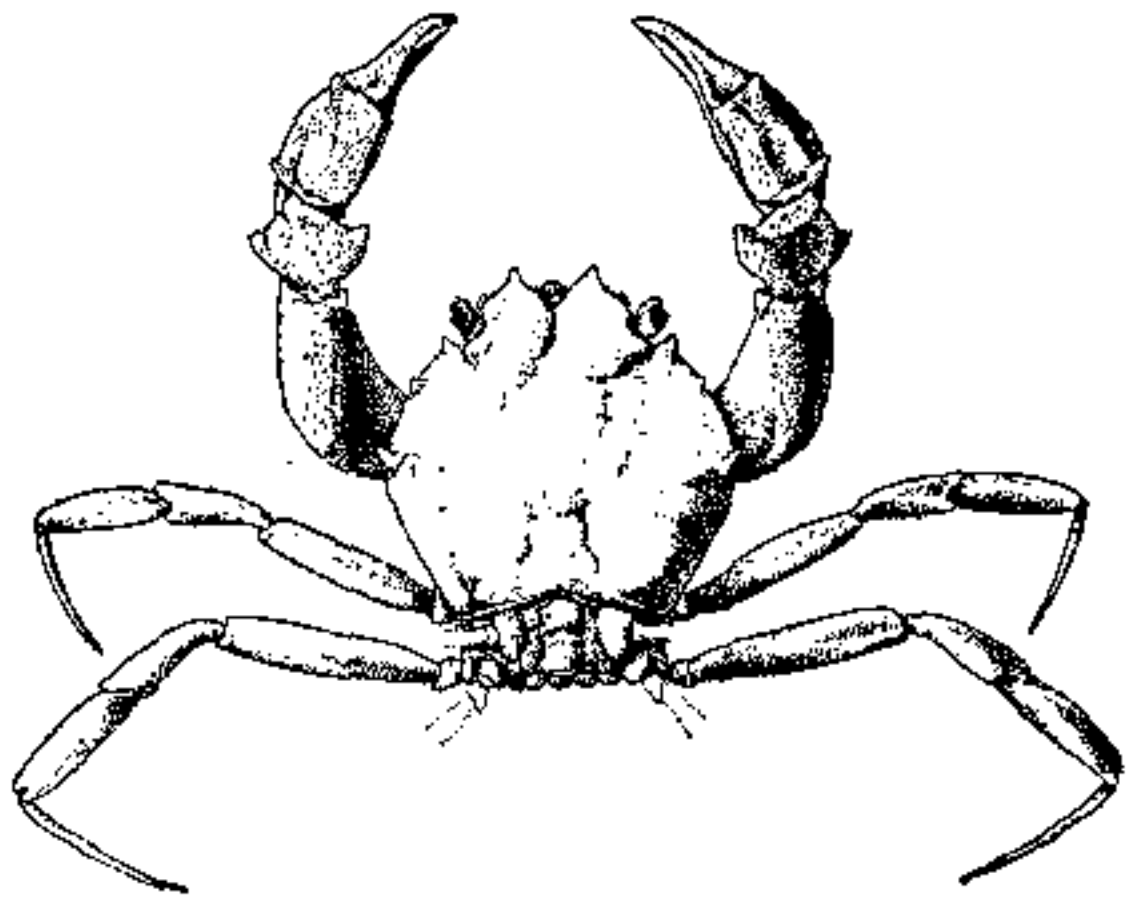


FIGURE 29.—*Clythrocerus planus*, male: Dorsal view, ×12.

Description.—Carapace subcircular, a little broader than long; dorsally flat, finely granulate, granules larger toward outer margin; gastric and cardiac-intestinal regions bounded by deep grooves. Front occupied by two triangular lobes, each tipped with a blunt tooth, and separated from each other by a broad V-shaped sinus, which is prolonged on the dorsal surface by a broad, shallow depression continued to gastric region; outer margin of each lobe slightly concave. Outer orbital tooth narrow, blunt, well-marked, directed obliquely outward. A tooth a little in front of middle of lateral margin is somewhat larger and directed forward and slightly outward. A much smaller triangular tooth at about one-third the distance from orbital to branchial tooth. Antennules hidden under carapace; antennae moderately enlarged. Anterior end of buccal cavity and

of merus of outer maxillipeds projecting slightly in advance of median sinus of front.

Chelipeds equal, rather short, stout, coarsely scabrous-granulate. Merus stout, unarmed. Carpus broader than long, having a shallow, platelike, blunt projection along its outer surface, a short blunt tooth at inner angle. Palm about as broad as long, bearing a stout blunt spine or tooth on outer side at articulation of carpus, and a lower, less conspicuous tooth at articulation of fingers; two feebly marked carinae, one connecting the two teeth, the other lower down. Digits longer than upper margin of palm, bent down, not gaping, pollex much stouter than dactylus, prehensile edges denticulate; dactylus with a superior longitudinal groove, inner superior margin subacute and continuous with that of palm. First ambulatory about twice as long as carapace, dactylus longer than propodus; second ambulatory exceeding the first by half the length of dactylus; third leg half as long as second, propodus thick, horn-shaped, dactylus equally long and curved, but slender; last leg similar, but longer and narrower.

Color.—Carapace of some specimens speckled with small black spots, in alcohol. Of the specimens from station 284, two (the largest and smallest) had a brown V on the back, on a china white ground; one was more or less pure china white.

Measurements.—Male (67437), length of carapace to end of rostral lobe 3.7, width 4 mm. Female, from the same gathering, length 3.5, width 4 mm.

Range.—Southern California; Mexico; shallow water to 40 fathoms.

Material examined.—See table 36, page 116.

CLYTHROCERUS LAMINATUS Rathbun

PLATE 80, FIGURES 1–4

Clythrocerus laminatus RATHBUN, Proc. Biol. Soc. Washington, vol. 48, p. 2; 1935 (type locality, Wenman Island, Galapagos Islands, 100–150 fathoms, male holotype, U.S.N.M. no. 69221).

Diagnosis.—Carapace wider than long. One lateral spine. Wrist of male with a large square plate on inner edge.

Description.—Carapace a little broader than long, measured on median line. A median furrow on frontal surface; two longitudinal furrows on gastric region and one on either side of cardiac region; a transverse furrow curved forward behind each orbit. Surface minutely granulate. Frontal teeth broad, subacute, sides slightly concave, at the outer end terminating in a small rectangular tooth. Outer orbital tooth bluntly rounded and pointing almost directly forward. Lateral marginal tooth a little in front of widest part of carapace; tooth acute, outer margin more than twice as long as inner margin, which is nearly transverse.

TABLE 36.—*Material examined of* Clythrocerus planus

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
CALIFORNIA:											
Near Rocky Point			12			May 10, 1924		Univ. Southern California.	1 ♂ 1 ovig. ♀	67437	
Do						May 17, 1924		do	1 ovig. ♀	U. S. C.	
Long Beach			10			Oct. 25, 1924		do	1 ovig. ♀	67438	
Laguna Beach								W. A. Hilton	1 ♂	50611	
									1 ♂ 1 ♀	50612	
Santa Catalina Island			Dredged			Jan. 1863		J. G. Cooper	1 ♀	22298	
Catalina Harbor (probably).								W. H. Dall	1 ♂ 1 ♀	14256	Cotypes.
Southern California						Nov. 30, 1912		Venice Marine Biol. Sta.	1 ♀ ovig	50464	
MEXICO:											
Santa Maria Bay, Lower California.	Mile W. of Hughes Point.		35–40			Mar. 7, 1934	281	*Velero III*	1 ♀	69196	Hancock Galapagos Exped.
Thurloe Bay, Lower California.	N. W. of Thurloe Point		30			Mar. 9, 1934	285	do	4 ♂ 4 ♀ (3 ovig.)	69197	Do.
Do	N. W. of Thurloe Point (nearer shore).		30			do	284	do	2 ♂ 2 ♀	69195	Do.

TABLE 37.—*Material examined of* Clythrocerus laminatus

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
	° ′ ″										
MEXICO: Clarion Island	*Sulphur Bay.*		25	*S.*		*Jan. 5, 1934*	*135*	*Velero III*	*5 ♀ (4 ovig.)*	*69186*	*Hancock Galapagos Exped.*
ECUADOR:	*Latitude S.*										
Galapagos Islands	0 55 00		58–60			Jan. 26, 1934	190	do	1 ♂	70773	Do.
									1 ♂	69221	Type, photo. Hancock Galapagos Exped.
									1 ♀	69194	Photo. Hancock Galapagos Exped.
Wenman Island			100–150			Jan. 11, 1934	143	do	1 ♂	69192	With shell, Hancock Galapagos Exped.
									1 ♀ ovig.	69222	Do.
									8 ♂2 ♀ ovig.	69193	
Albemarle Island	Cartago Bay 2 miles from white rock.		32	M.		Jan. 25, 1934	185	do	3 ♂11 ♀	69187	Hancock Galapagos Exped.
Do	Cartago Bay, SW. part.		8–10			do	187	do	3 ♀	70774	Do.
Chatham Island	E. of Wreck Bay		32			Jan. 21, 1934	170	do	7 ♂2 ♀ ovig.	69185	Do.
Hood Island	Gardner Bay, W. of bay.		25–35			Jan. 31, 1934	201	do	1 ♂3 ♀	70775	Do.

Carpus of cheliped much broader than long; a large, blunt, triangular tooth on outer surface; a more prominent, rectangular plate projecting inward from inner surface. Chelae heavy; palms widening distally, slightly convex in outline below; upper surface at right angles to outer and marked by a low blunt ridge with a small tooth at either end; a similar ridge below on outer surface. Fingers stout, fitting together when closed; fixed finger triangular, curved slightly downward.

Ovigerous females much smaller than males. Carpus with a triangular inner tooth similar to the outer tooth and thereby widening the carpus perceptibly toward distal end.

Color.—Ovigerous female (69185), reddish speckled; others of this haul gray, brownish, or white.

Measurements.—Male (69221), length of carapace 4.5, width 5 mm. Female, ovigerous, same locality, length 2.7, width 3.3 mm.

Range.—Mexico to the Galapagos Islands.

Material examined.—See table 37, page 117.

CLYTHROCERUS DECORUS Rathbun

FIGURE 30; PLATE 34, FIGURES 3, 4

Clythrocerus sp. RATHBUN, Harriman Alaska Expedition, vol. 10, p. 169, pl. 9, fig. 5, 1904.

Clythrocerus decorus RATHBUN, Proc. Biol. Soc. Washington, vol. 46, p. 185, 1933 (type locality, off Santa Rosa Island, Calif., male holotype, U.S.N.M. no. 67435).

Diagnosis.—Two lateral teeth or spines, the distance between them less than between the foremost tooth and the orbital tooth. Two frontal teeth with long, cylindrical tips.

Description.—Carapace equally long and broad, depressed, regions plainly marked, coarsely granulate, the granules disposed in groups

FIGURE 30.—*Clythrocerus decorus*, male (67435): Carapace, dorsal view, × 11.

on the regions, furrows smooth. Front divided into two broad teeth which terminate in blunt widely separated spines with parallel sides. Orbit with a triangular notch above and an outer subacute spine. Two stout, denticulate teeth or spines on anterolateral margin, the interspace shorter than that between the anterior one and the orbital spine. Lateral margin finely denticulate. Lower surface more

coarsely granulate than dorsum; edge of orbit denticulate; antennules fitting snugly in their sockets; peduncle of antennae tipped with a tubercle. Two tubercles below orbit. A deep sinus behind the orbit continuous with the pterygostomian sinus. Endognath of outer maxilliped with two longitudinal grooves. Chelipeds stout, very coarsely granulate; merus short; carpus obliquely quadrilateral, two lobes on outer margin, one at inner angle; upper surface of palm broad, longitudinally hollowed, a lobe or tooth at either end of outer margin; digits broad and thick, inclined slightly downward and inward, prehensile edges meeting. Merus and carpus of first two ambulatories spinulous on margins; dactylus longer than propodus; second leg sensibly longer than first. The ischium, merus, carpus, and propodus of fourth leg subequal in length, dactylus shorter.

Measurements.—Male, holotype (67435), length and breadth 6 mm.

Range.—Southern California.

Material examined.—As follows:

California: Off Brockway Point, Santa Rosa Island; 38 to 45 fathoms; April 15, 1904; station 4431, *Albatross;* 1 male, holotype (67435), figured. Catalina Island; dredged; January 1863; J. G. Cooper; 1 male (25866), figured. Off Point Loma; lat. 32°38′00″ N., long. 117°14′00″ W., in trawl; November 3, 1907; Scripps Institution; 1 specimen (53958).

CLYTHROCERUS GRANULATUS Rathbun

FIGURE 31; PLATE 33, FIGURES 5–8

Cyclodorippe granulata RATHBUN, Bull. Lab. Nat. Hist. State Univ. Iowa, vol. 4, p. 293, pl. 9, fig. 1, 1898 (type locality, off Trinidad, B. W. I., 73 fathoms; type, U. S. N. M. no. 20510).

Diagnosis.—Carapace and appendages densely granulate. Only one lateral tooth or spine. Margins of carapace spinulous. Front divided roughly into three teeth.

Description.—Superior and inferior surfaces closely and coarsely granulate; lateral margins of posterior half fringed with minute, slender spinules; slightly above and near the widest part of the carapace a short, sharp spine. Rostral and orbital region depressed, remainder of carapace swollen; branchio-cardiac sutures deep. Front subtriangular, divided into three blunt teeth by intervening depressions; the two lateral teeth with finely spinulous edge, the median tooth entire, although occasionally with a minute notch. A longitudinal furrow leads backward from orbit; outside this, the orbital margin is transversely oblique, lower border more advanced and transverse. A deep furrow borders the pterygostomian region; it is very wide anteriorly and narrows to a point near the widest part of carapace.

Ischium of outer maxilliped with parallel margins, almost twice as long as merus, which is a little wider posteriorly than ischium; exognath just as long as merus and widest at middle. Chelipeds rather slender, rough; carpus with two spinules on inner margin, a spinule on outer surface near distal end; manus finely spinulous, about twice as long as wide, with parallel margins; digits of same length as manus, bent slightly downward. First and second ambulatories slender, cylindrical, the second pair less than twice as long as carapace, dactylus and propodus subequal; third and fourth legs shorter than carapace and of subequal length, the fourth slenderer, the propodal and terminal articles very slightly curved.

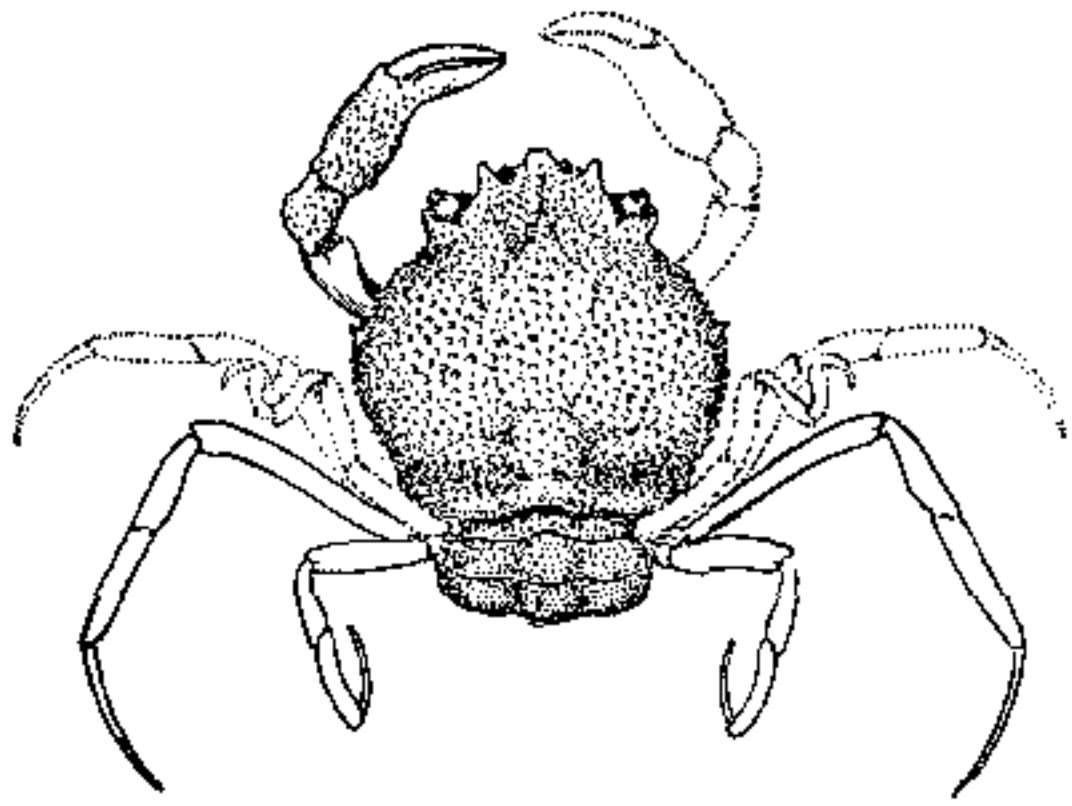


FIGURE 31.—*Clythrocerus granulatus*, female holotype: Dorsal view, ×6¾.

Measurements.—Female (67447), length of carapace 3.2, width 3.4 mm. Male (67453), length 2.8, width 3.1 mm.

Range.—Florida to Venezuela, 70 to 310 fathoms.

Material examined.—As follows:

Florida: John B. Henderson: Fowey Rocks: SE. by S., 70 fathoms, no. 355, 2 males, 4 females (67454); 75–90 fathoms, no. 364, 5 males (67453); 75–100 fathoms, no. 361, 3 females (1 with parasite) (67452); 85 fathoms, no. 363, 1 female (67451); 95 fathoms, no. 362, 1 male, 4 females (67450); E. by N., 90 fathoms, no. 352, 1 male (67449). Ragged Key, E., 75–90 fathoms, no. 366, 2 males, 2 females (67448). Sand Key, SE. by E., 75 fathoms, 2 females (67447). Ajax Reef, 70–90 fathoms, no. 370, 1 female (67446).

Virgin Islands: Lat. 18°38′15″ N., long. 65°00′30″ W.; 310 fathoms; March 3, 1933; station 97, Johnson-Smithsonian expedition; 1 male (67820).

Venezuela: Northwest of Trinidad; lat. 11°07′00″ N., long. 62°14′30″ W.; 73 fathoms; bu. M.; January 30, 1884; station 2120, *Albatross;* 1 female, holotype (20510).

CLYTHROCERUS STIMPSONI, new species

FIGURE 32; PLATE 34, FIGURES 5, 6

Type locality.—West coast of Florida; 100 fathoms; April 22, 1872, William Stimpson, *Bache;* 1 female holotype (M. C. Z. no. 8261).

Diagnosis.—Carapace a third wider than long. Two lateral teeth (paired) at widest part of carapace. A tubercle behind orbit.

Description.—Carapace convex; anterior teeth separated by a depression from remainder of carapace. Surface finely granulate, a few larger granules in advance. Mesogastric region defined; protogastric with two impressed lines directed backward and slightly inward, enclosing a narrow strip. Lateral margin, including the

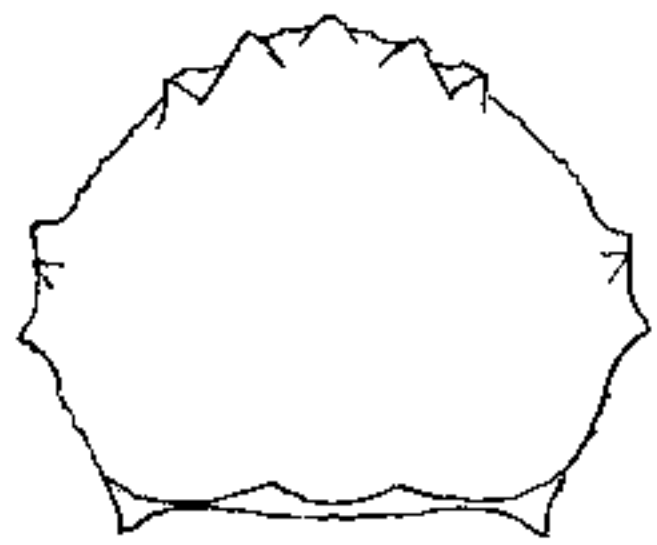


FIGURE 32.—*Clythrocerus stimpsoni*, female holotype (M. C. Z. no. 8261): Outline of carapace, ×10.

teeth, bordered by minute spinules; above and between the teeth a small spine forming a right angle with them. Median rostral tooth triangular, blunt, more advanced than inner orbital teeth; the latter are tipped with a smaller slender spine; superior orbital sinus triangulate; outer orbital teeth directed obliquely outward, their anterior margin convex; lower margin prominent, transverse, with a spinule at its middle. Abdomen of female very broad, a low median tubercle on segments 2, 3, 4, and 5; a short spinule on either side of third segment. Maxillipeds very prominent, with raised margins; an oblique spinuliferous ridge at middle of merus, in front of it a longitudinal furrow, continued on merus; exognath with arcuate, raised outer margin; all ridges more or less spinulous. A pterygostomian ridge runs from just behind tip of exognath backward to a point *opposite the first lateral tooth of carapace; it is armed with about 10* spinules.

Measurements.—Female holotype, length of carapace to tip of spine 3.2, width 4.3 mm.

Range.—Known only from the type specimen.

Family LEUCOSIIDAE Dana

Leucosidae DANA, United States Exploring Expedition, Crustacea, pt, 1, p. 390, 1852; pt. 2, p. 1427, 1853.

Leucosiidae MIERS, Voyage of H. M. S. *Challenger*, Brachyura, vol. 17, p. 297, 1886.—ALCOCK, Journ. Asiatic Soc. Bengal, vol. 65, p. 164, 1896.—IHLE, Die Decapoda Brachyura der *Siboga* Expedition, Monogr. 39b², p. 186, 1918.

Carapace circular, oval or polygonal. Eyes and orbits very small; front narrow but many times wider than orbit. Antennules folding more or less obliquely. Antennae small, sometimes obsolete. External maxillipeds completely closing the buccal cavern, except that often there is a crevice in front; the palp springs from a groove in their dorsad surface near the inner edge, and is completely concealed when the maxillipeds are in repose; exognath broad. The afferent branchial channels occupy the sides of the endostome on either side of the deep median endostomial groove which serves as an efferent branchial channel. The afferent channels are covered in by the exognaths of the external maxillipeds; the efferent channels, by a pair of lamellar processes from the first maxillipeds. Chelipeds symmetrical. Commonly the third to sixth abdominal terga are fused, sometimes the sixth is independent. The vasa deferentia emerge through the fifth thoracic sternum on either side, near the bases of the posterior legs. (After Alcock.)

KEY TO THE SUBFAMILIES AND GENERA OF THE FAMILY LEUCOSIIDAE

A[1]. Merus of external maxillipeds half or more than half the length of the ischium measured along the inner border. Fingers stout, gradually narrowing from base to tip.
- B[1]. The pterygostomian margin terminates anteriorly in a circular depression behind the orbit. Surface of carapace uneven. Chelipeds of moderate length ..... **EBALIINAE** (p. 123)
  - C[1]. Carapace broadly elliptical, sides expanded ..... **Uhlias** (p. 149)
  - C[2]. Carapace narrower, pentagonal to octagonal, surface very uneven.
    - D[1]. Deep hollows or caves within the posterior half of the carapace ..... **Speloeophorus** (p. 141)
    - D[2]. No deep hollows or caves within the posterior half of the carapace.
      - E[1]. Upper surface of carapace deeply excavate ..... **Lithadia** (p. 136)
      - E[2]. Upper surface of carapace uneven but not deeply excavate ..... **Ebalia** (p. 123)
- B[2]. The pterygostomian margin does not terminate in a circular depression and is often obscure. Carapace almost hemispherical, surface only slightly uneven. Chelipeds often elongate ..... **PHILYRINAE** (p. 151)
  - C[1]. Anterior margin of efferent branchial channel forming the lower margin of orbit.
    - D[1]. Chelipeds rather massive. Abdominal segments 3–5 fused in male ..... **Persephona** (p. 151)
    - D[2]. Chelipeds long and slender. Abdominal segments 3–6 fused in male. Cardiac and intestinal regions indicated ..... **Myropsis** (p. 164)
  - C[2]. Anterior margin of efferent branchial channel separated by a deep, narrow channel from the lower margin of orbit.
    - D[1]. Lateral and posterior margin of carapace marked by a continuous beaded line. Exognath very broad, anterior portion strongly arcuate ..... **Philyra** (p. 167)

D². Lateral and posterior margin of carapace not marked by a continuous beaded line.
E¹. Sixth segment of male abdomen with a marginal spine overlapping fifth segment.....**Leucosilia** (p. 170)
E². No spine on male abdomen. Exognath not dilated, outer margin nearly straight. Chelipeds stout.**Randallia** (p. 171)
A². Merus of external maxillipeds less than half the length of the ischium measured along the inner border. Fingers slender, of subequal width throughout.....**LEUCOSIINAE**[17] (p. 183)
B¹. Posterior half of carapace with seven spines. Anterior half of carapace with three spines on either side.....**Callidactylus** (p. 192)
B². Posterior half of carapace with not more than five spines, usually three or four. Anterior half of carapace with no spines or with one spine on either side.
C¹. Posterior half of carapace with three spines.....**Iliacantha** (p. 183)
C². Posterior half of carapace with four spines (exceptionally showing trace of a rudimentary fifth).....**Leucosia** (p. 194

Subfamily EBALIINAE Stimpson

Ebaliinae STIMPSON, Bull. Mus. Comp. Zool., vol. 2, p. 159, 1871.—IHLE, Die Decapoda Brachyura der *Siboga*-Expedition, Monogr. 39b², p. 205, 1918.

Surface of carapace uneven. Chelipeds of moderate length. Palm and fingers normal, fingers not very thin or very elongate. The dactylus moves often in an oblique plane. Anterior margin of buccal cavity arcuate, the middle part in front of the line of the anterior pterygostomian region. Epistome and infraorbital lobe well developed. The pterygostomian margin extends either slightly or distinctly forward and terminates in an indentation. Merus of external maxillipeds half or more than half the length of the ischium measured along the inner border. Very often the first abdominal segment in the female is under the carapace, and the abdominal formula is 2 + 3 + 4 to 6 + 7 or 2 + 3 to 6 + 7.

Genus EBALIA Leach

Ebalia LEACH, Malacostraca Podophthalmata Britanniae, text of pl. 25, 1817 [type, *E. tuberosa* (Pennant, 1777) = *E. pennantii* Leach, Zoological miscellany, vol. 3, p. 18, 1817].—ALCOCK, Journ. Asiat. Soc. Bengal, vol. 65, p. 185, 1896.

Carapace rhomboid or pentagonal or hexagonal, commonly bud not always a little broader than long; its regions usually well definen and tumid, tumid portions nodular or granular; its posterior margit is generally a little prominent and either bilobed or with its extreme

[17] In connection with the use of Leucosiinae for this group of genera, attention is called to a decision made by me in "A Revision of the Nomenclature of the Brachyura" (Proc. Biol. Soc. of Washington, vol. 11, p. 160, 1897). In 1810, Latreille in his "Considérations Générales sur l'Ordre Naturel des Animaux Composant les Classes des Crustacés, des Arachnides, et des Insectes," p. 422, specified the type of *Leucosia* as *L. nucleа* Fabricius (Supplementum entomologiae systematicae, p. 313, 1798) = *Cancer nucleus* Linnaeus, 1758. In 1817, Leach (Zoological miscellany, vol. 3, p. 19) made this species the type of a new genus, *Ilia*. *Leucosia* Fabricius as typified by Latreille, therefore, takes precedence of *Ilia*, a synonym, and also precedence of *Leucosia* Leach (op. cit., p. 21) for the species *L. craniolaris* Fabricius, 1798—*Cancer craniolaris* Linnaeus, 1758. For this latter genus I proposed, in 1897, *loc. cit.*, the name *Leucosides*.

ends dentiform. In the orbital wall there are, as usual, three sutures, and a gap at inner canthus; edge of roof of orbit more or less emarginate. The antennules fold obliquely or nearly transversely. Antennae minute but distinct. Buccal cavern moderately elongate; the exopodite of external maxillipeds not dilated, its outer edge a little curved; triangular merus of external maxillipeds about three-fourths length of ischium measured along inner border. Chelipeds variable, usually massive; in the typical forms short, not much more than half again as long as carapace, and stout, with short, broad hands not differing much in length from the stout, compressed fingers. (After Alcock.) The abdomen of the male consists of three pieces, of the female of four pieces in the American forms, and the male has a sharp spine at proximal end of sixth segment.

Atlantic, Indian, and Pacific Oceans.

KEY TO THE AMERICAN SPECIES OF THE GENUS EBALIA

A¹. Carapace hexagonal or subglobular..... **stimpsonii** (p. 124)
A². Carapace octagonal.
  B¹. Carapace not posteriorly excavate.
    C¹. A narrow, granulated ridge extends upward from the lateral tooth toward the highest part of the branchial region.
      D¹. Last three articles of cheliped not cristate. Posterior lobes of carapace subglobular..... **cariosa** (p. 125)
      D². Merus of cheliped cristate. Posterior lobes of carapace subtriangular..... **magdalenensis** (p. 128)
    C². No narrow, granulated ridge extends upward from the lateral tooth.
      D¹. A broad, sharp crest on last three articles of chelipeds.. **cristata** (p. 132)
      D². A low inconspicuous crest on last three articles of chelipeds.
        E¹. Two triangular teeth on lateral margin of carapace at its widest part..... **hancocki** (p. 128)
        E¹. No marginal teeth on carapace at its widest part.. **clarionensis** (p. 132)
  B². Carapace deeply excavate about cardiac region..... **rotundata** (p. 135)

ANALOGOUS SPECIES OF EBALIA ON OPPOSITE SIDES OF THE CONTINENT

ATLANTIC	PACIFIC
cariosa.	*magdalenensis.*

EBALIA STIMPSONII A. Milne Edwards

FIGURE 33; PLATE 35, FIGURES 1–3; PLATE 37, FIGURES 1–3

Ebalia stimpsonii A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 22, 1880 (type locality, Barbados, 7½–50 fathoms; type, M. C. Z. no. 2761).—RATHBUN, Bull. Lab. Nat. Hist. State Univ. Iowa, vol. 4, p. 293, 1898; Bull. U. S. Fish Comm. for 1900, vol. 20, pt. 2, p. 87, 1901.

Ebalia stimpsoni A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 27, p. 118, pl. 23, figs. 6, 7; pl. 24, fig. 2, 1902.

Diagnosis.—Carapace more even than customary, depressed in hepatic area only. An hepatic and a pterygostomian prominence. Four posterior protuberances.

Description.—Carapace hexagonal, length and width subequal; surface more even than usual in the genus; covered with crowded, depressed granules, smaller on anterior third; a few prominent granules; a row of outstanding granules on lateral margin; hepatic region depressed, its margin forming a low, blunt prominence a little in front of branchiohepatic suture; the pterygostomian prominence is farther forward, subacute; cardiac region swollen, surrounded by a depression; a posterolateral lobe in transverse line with middle of cardiac region; posterior border bilobed. In the male the 4 posterior protuberances are subrectangular, rounded at tip; in the female these lobes are very shallow, the posterior pair forming together a

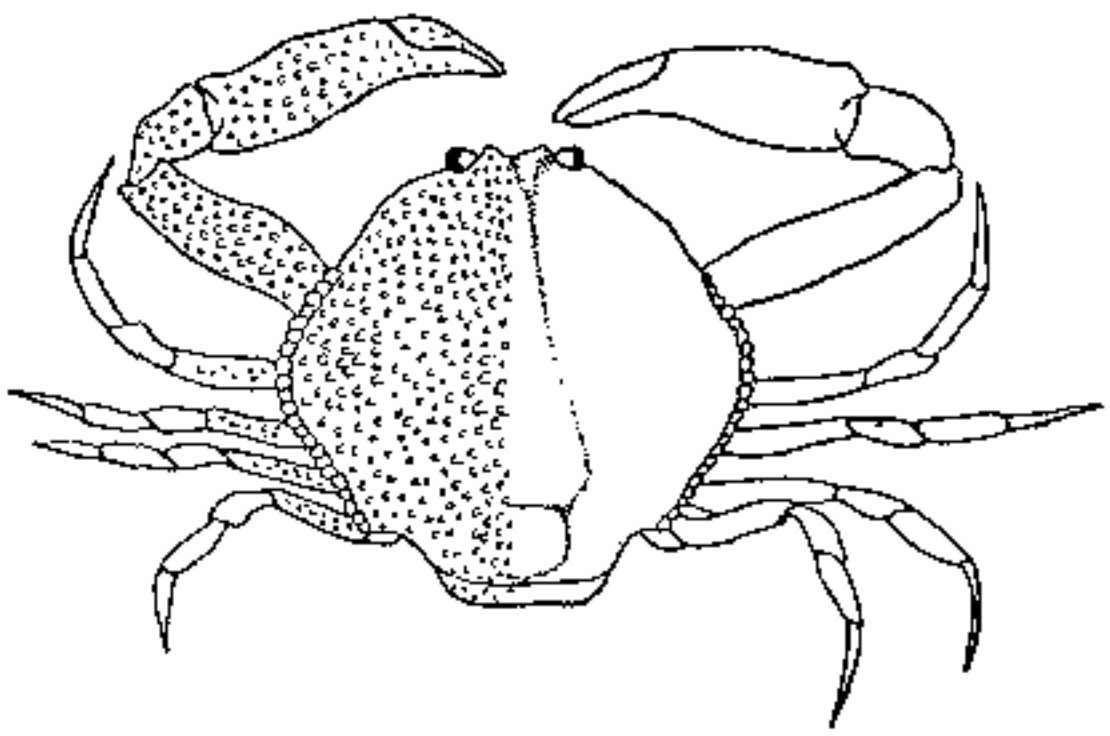


FIGURE 33.—*Ebalia stimpsonii*, female: Dorsal view, × 5. After A. Milne Edwards and Bouvier.

horizontal line. Front bidentate, broadly emarginate. Chelipeds covered with granules, coarser on merus than on manus; legs slender, covered with smaller granules. Inferior surface of body also granulate.

Measurements.—Male (66514), length of carapace 5.6, width 5.4 mm.; female, length 5.8, width 5.7 mm.

Range.—West Florida to Barbados; 4 to 80 fathoms.

Material examined.—See table 38, page 127.

EBALIA CARIOSA (Stimpson)

PLATE 35, FIGURES 6, 7

Lithadia cariosa STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 7, p. 238, 1860 (type locality, Beaufort, N. C.; type not extant).—RATHBUN, Ann. Inst. Jamaica, vol. 1, p. 39, 1897.—HAY and SHORE, Bull. U. S. Bur. Fisheries, vol. 35 (1915–16), p. 424, pl. 32, fig. 6, 1918.

Ebalia (*Lithadia*) *brasiliensis* VON MARTENS, Arch. für Naturg., vol. 38, p. 115, pl. 5, figs. 10, 10b, 1872 (type locality, Bay of Rio de Janeiro; type in Berlin Mus.).

Lithadia lacunosa KINGSLEY, Proc. Acad. Nat. Sci. Philadelphia, 1879, p. 403, 1880 (type locality, Sarasota Bay, Fla.; type, U. S. N. M. no. 42226).

Lithadia geometrica BOONE, Bull. Bingham Ocean. Coll., vol. 1, p. 45, fig. 9, 1927 (type locality, Swan Island; type missing from Bingham Oceanographic Collection).

Diagnosis.—Carapace octagonal. Cardiac region deeply separated from branchial and intestinal regions. A strong pterygostomian tooth.

Description.—Body and feet everywhere tuberculate or granulate above and below. Carapace convex, subrhomboidal, anterior and posterior angles truncate, lateral angles obtuse. A tooth on posterolateral margin, separated by a deep sinus from the intestinal region which is bilobate. The anterolateral margin of the hepatic region is sinuous; the region is posteriorly defined by an impressed line; the pterygostomian region has a downward-pointing tooth, hardly visible in dorsal view. Cardiac and inner lobules of branchial region strongly protuberant. Front elevated and connected with the middle protuberances by a narrow longitudinal ridge traversing the gastric region. On either side of this ridge there is a deep and rather broad excavation of a darker color than the protuberant parts, which extends laterally over the anterior part of the branchial region but is nearly divided in two by the slightly prominent hepatic region, which projects inward from the anterolateral margin, with an arcuated inner edge armed with prominent granules. A similar deep and very narrow sulcus separates the cardiac from the branchial regions, and passes behind the former, separating it from the thick intestinal lobes. A slight shallow depression on the branchial region along the posterolateral margin. On the protuberant middle and posterior parts of the carapace the granules are very large and somewhat irregularly piled upon one another, leaving upon the cardiac numerous small eroded cavities. Front strongly prominent, with a concave margin fissured at middle.

Merus of cheliped broader than hand, outer margin convex and a little irregular; hands rather small, uniformly granulated above and below and tapering to rather slender fingers. Legs cylindrical, covered with small granules, which on the dactyls become minute, crowded, and almost spinuliform. Sternum and abdomen covered with small, hard smooth tubercles. Abdomen armed with a backward-pointing tooth at proximal end of penult segment. (After Stimpson.)

Color.—A light gray or buff; female occasionally with two or three small red spots on abdomen (*Hay*). *Pale red* (von *Martens*). *Sternum* and abdomen ornamented with seven or eight red dots (Stimpson).

Measurements.—Male (51382), length 11.8, width 12.4; female (51382), length 13.3, width 14.5 mm.

Habit.—Not uncommon at depths from 1 to 5 fathoms in the channels about Beaufort. When brought to the surface in the dredge it feigns death and is only with difficulty distinguished from the pebbles and bits of shell among which it appears to make its home. Eggs occur at intervals throughout the summer. (Hay.)

Range.—North Carolina to Brazil; below low tide to 25 fathoms.

Material examined.—See table 39, page 130.

TABLE 38.—*Material examined of* Ebalia stimpsonii

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
FLORIDA:	° ′ ″	° ′ ″			° C.						
W. of Cape Romano.	25 50 15	82 41 45	21	sd y		Apr. 2, 1901	7124	*Fish Hawk*	1 ♂	25601	
N. of Tortugas	25 00 31	83 03 00	29	mod. hrd.; some Sh.		Feb. 16, 1889	5054	*Grampus*	1 ♀	18201	
Tortugas, White Shoals.			7–8			July 17, 1924	19	W. L. Schmitt	1 ♀	66528	Gift of Carnegie Institution.
Do			About 9			July 19, 1924	22	do	1 ♀	66525	Do.
Do	About 13 mi. S. of no. 2 red buoy.		80–100			July 20, 1924	35, 36	do	1 ♂ 1 ♀	66514	Do.
Tortugas	About 10 mi. S. of no. 2 red buoy.		45			July 22, 1924	43	do	1 ♂	66527	Do.
Do	Cross channel haul E. of Loggerhead Key, from S1 to N2 buoy.		10	Boat dredge		June 11, 1925	211	do	1 ♂	66523	Do.
Do	About 7 mi. S. of no. 2 red buoy.		20	crs. gy. S		do	216	do	1 ♀	66513	Do.
Inside Sombrero Key.								*Bache;* Wm. Stimpson	2	6664, M. C. Z.	
BAHAMAS: Bahama Banks.				From Millepores.		May 15–17, 1893		State Univ. Iowa Bahama Exped.	1 ♀ 1 ♀	20029 S. U. I.	With *Peltogaster* in the maxillae.
PUERTO RICO:											
Mayaguez Harbor.	Tangent of land about Point Melomas, S. 13½ mi. Custom House, E. ¼ N., 4⅜ mi.		33½	S. M	24.7	Jan. 20, 1899	6064	*Fish Hawk*	1 ♀	24522	
Do	Tangent of land, S. about Point Melomas, 11 mi. Custom House, NE. ¾ E., 4½ mi.		4–6	Co	20	do	6065	do	1 ♂	24523	
BARBADOS			7½–50	Co. S. brk. Sh		1878–79	287	*Blake*	1 ♀	2761, M. C. Z.	Type.

EBALIA MAGDALENENSIS Rathbun

FIGURE 34; PLATE 35, FIGURES 4, 5

Ebalia magdalenensis RATHBUN, *in* Glassell, Trans. San Diego Soc. Nat. Hist., vol. 7, p. 334, pl. 22, 1933 (type locality, Magdalena Bay, Mexico; type, U.S.N.M. no. 67429).

Diagnosis.—Posterior lobes of carapace triangular, separated. Posterolateral lobes similar, larger. Front slightly bidentate. Hepatic region not defined posteriorly by an impressed line. Lateral angle of carapace obtuse; the border behind slightly convex.

Description.—Shape resembling that of *E. cariosa*. Carapace covered with much finer, crowded granules. Front with two shallow, obtusangled lobes; orbits oblique, behind the front. Median carina broad and blunt, concave in profile, narrowing toward middle of carapace, indicating the mesogastric region. Hepatic prominence very slightly produced; anterolateral cavity suboblong, granules largest in the deepest part. The highest point of the branchial region is at its inner anterior angle, from which a concave line trends toward the lateral angle of the carapace. Behind this, the surface is convex and uneven, showing two low elevations. A right angled tooth at posterolateral angle. A deep furrow either side of the cardiac region surmounted by a blunt lobe. Intestinal lobes broad, triangular, blunt. Subhepatic projection prominent, extending downward and forward, tip lobiform. Chelipeds granulate, coarser on merus, becoming finer toward fingers; three lobes on posterior cristate margin of merus, manus coarsely granulate above, fingers slender, hairy on prehensile edge. Ambulatory legs with acornlike granules, one row on merus, two rows above on carpus and propodus, one row below on propodus.

Color.—Preserved specimens show four red dots in a square on the female abdomen, and red color on distal half of fingers.

Measurements.—Female holotype, length of carapace on median line 11, length to tip of intestinal lobe 11.7, width 11.3 mm.

Range.—Mexico to Ecuador; 2 to 18 fathoms.

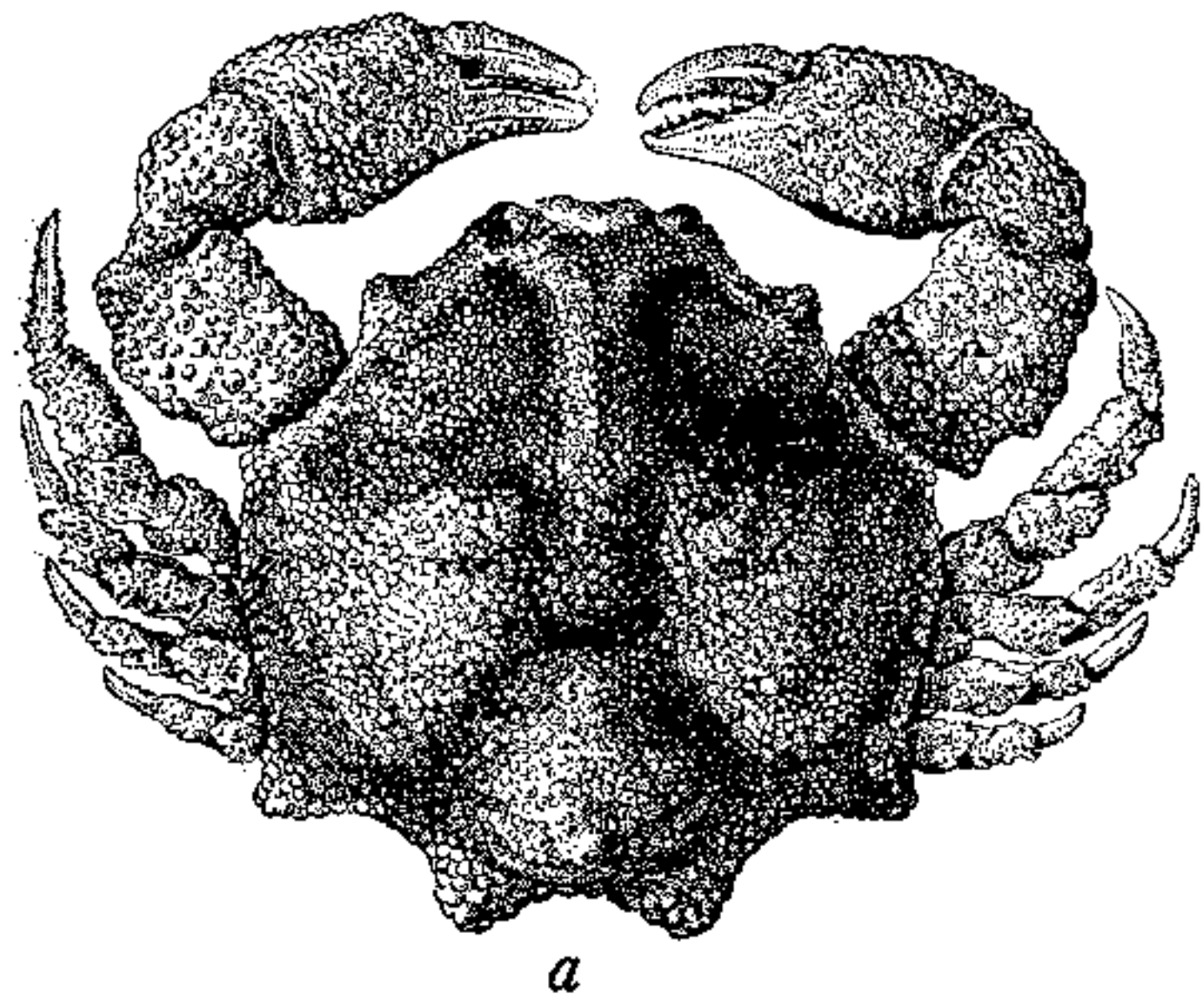
Material examined.—See table 40, page 131.

EBALIA HANCOCKI Rathbun

PLATE 36, FIGURES 6–8; PLATE 82, FIGURES 1, 2

Ebalia hancocki RATHBUN, Proc. Biol. Soc. Washington, vol. 46, p. 183, 1933 (type locality, Charles Island, Galapagos; type, U. S. N. M. no. 67988).

Diagnosis.—Carapace broader than long. Posterior lobes extremely shallow. Hepatic region elevated. An excrescence above base of movable finger.



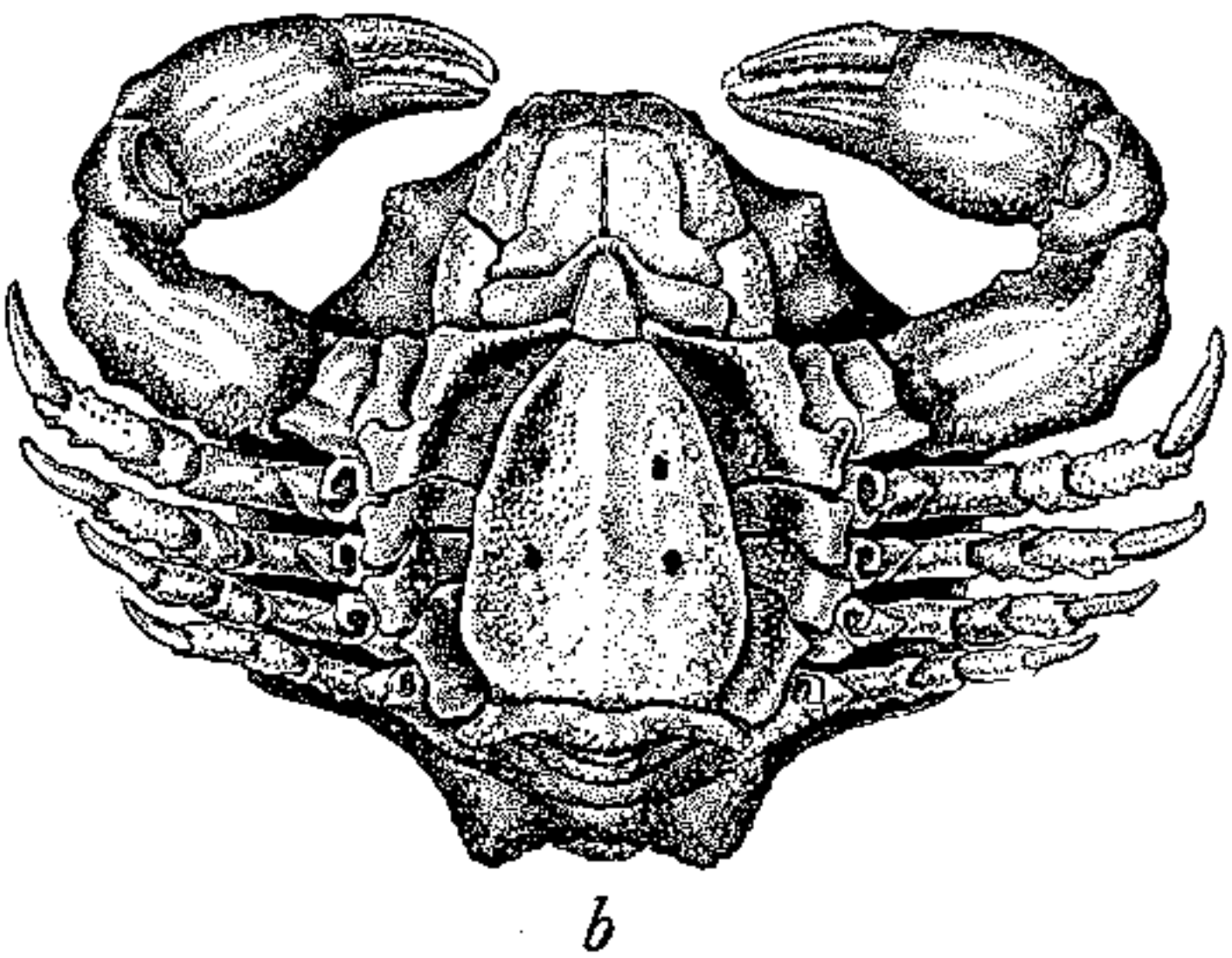


FIGURE 34.—*Ebalia magdalenensis*, female holotype: *a*, Dorsal; *b*, ventral. × 4.8. After Glassell.

TABLE 39.—*Material examined of* Ebalia cariosa

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
NORTH CAROLINA:	° ′ ″	° ′ ″			°C.						
Bogue Sound, off Beaufort				Dredged		July, 1912		W. P. Hay	2 ♂ 1 ♀	51382	From Bur. Fisheries.
FLORIDA:											
Biscayne Bay	3½ mi. SW. by W. ½ W. of Soldier Key.		10½		23.5	Mar. 7, 1903	7482	*Fish Hawk*	1 ♀	55214	
Key Largo			Below low tide.	Grass				H. Hemphill	1 ♀	17857	
Lower Matacumbe Key.			do	do		1885		do	1 ♀	17861	
Hawk Channel	4¼ mi. W. by N. of Elbow Reef beacon.		2¾	S	20.5	Feb. 19, 1903	7467	*Fish Hawk*	1 ♂	55216	
Tortugas	About 8 mi. S. of no. 2 red buoy.		25	Picked from coral rock.		June 11, 1925	217	W. L. Schmitt	1 ♀	66529	Gift of Carnegie Institution.
Marco								H. Hemphill	15 ♂ 6 ♀	17858	Encrusted with *Membranipora*.
					°F.						
Off Sanibel Islands.	Bell buoy off Light, NE. 10 to 2½ mi.			Beam trawl	67	Jan. 1, 1913	7795	*Fish Hawk*	1 ♂	55206	
Off Gasparilla Island.	Gasparilla Lt., SE. by E. 6½ mi.			hrd. S. brk. Sh		Jan. 4, 1913	7800	do	1 ♂	55198	
Sarasota Bay								H. E. Webster	1 ♂ 1 ♀	56795	From Boston Soc. Nat. Hist.
Do									1 ♂	42226	Type of *Lithadia lacunosa*. Union College collection.
Do						Feb., 1884		H. Hemphill	1 ♂	17859	
Off Long Boat Inlet.	Inlet ENE. 4½ mi.			S. brk. Sh		Jan. 5, 1913	7802	*Fish Hawk*	3 ♂ 1 ♀	55205	
Boca Ciega Bay, inner shore of Pine Key.						Jan., 1884		H. Hemphill	1 ♀	17860	
					°C.						
Highland	27 55 30	82 51 30	3	hrd. S. brk. Sh.	15.8	Jan. 28, 1902	7249	*Fish Hawk*	1 ♀	55215	
North Key	28 50 30	83 11 45	7	sdy. stky	16.5	Dec. 9, 1901	7210	do	1 ♀	55217	
Cedar Keys			2	Dredged				H. Hemphill	3 ♀	17856	
JAMAICA: Port Royal								P. W. Jarvis		Inst. of Jamaica.	
BRAZIL:	*Latitude S.*										
Rio de Janeiro									1 ♀ 1 ♂, 16x16mm.	Berlin Mus.	Type of *Lithadia brasiliensis*.
Brazil									1 lge. ♂	Copenhagen Mus.	

TABLE 40.—*Material examined of* Ebalia magdalenensis

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
MEXICO:	° ′ ″	° ′ ″									
Marcy Channel, Magdalena Bay			18			Dec. 3, 1931		S. A. Glassell	1 ♀ type 2 ♀	67429 Glassell coll	
Concepcion Bay, Gulf of California.			15			Jan. 19, 1931		do	1 ♀ y	Glassell coll	
Punta Peñascosa, Sonora.						Feb. 1934		H. N. Lowe	1 ♀	69399	
COSTA RICA:											
Cocos Bay, Puerto Culebra.			2-4			Mar. 15, 1933	116	*Velero III*	1 ♀	68000	Hancock Galapagos Exped.
Puerto Culebra	In bay		3-10			Feb. 24, 1934	254	do	1 ♂	69272	Do.
Do	Dredging around isles in bay.					Feb. 15, 1934	257	do	1 ♂	69271	Do.
	Latitude S.										
ECUADOR: La Libertad	North of Point St. Elena.		8-10			Feb. 9, 1934	209	do	2 ♂	69763	Do.

Description.—Near *E. magdalenensis.* Carapace broader than long. Surface covered with large globular granules, in large part separated. Frontal margin divided by a short impressed line into two shallow blunt teeth. Branchial elevation larger than in *E. magdalenensis;* its anterior, highest portion has finer, closer granules. The anterolateral depression is restricted by a hepatic elevation; behind this the anterolateral margin of the carapace is plainly indicated; just below it, a rectangular pterygostomian tooth, behind which are two triangular spines, the hinder pair at the widest part of the carapace, the beginning of the lateral margin of the branchial region which is bordered with flat spinules. Posterior lobes broad, arcuate and very shallow. Subhepatic region acutely pointed. Chelipeds and legs very rough; a triangular tooth on upper base of movable finger; manus much swollen laterally.

Measurements.—Female holotype, extreme length of carapace 7.2, width 8 mm.

Range.—Mexico; Galapagos Islands.

Material examined.—See table 41, page 133.

EBALIA CLARIONENSIS Rathbun

PLATE 82, FIGURES 3, 4

Ebalia clarionensis RATHBUN, Proc. Biol. Soc. Washington, vol. 48, p. 2, 1935.

Type locality.—Sulphur Bay, Clarion Island, Mexico; 32 fathoms; nullipores; January 5, 1935, no. 136; Hancock Galapagos Expedition; 1 male (U. S. N. M. no. 69343).

Diagnosis.—Surface covered with crowded punctae. No marginal teeth at widest part of carapace. A small median hollow on cardiac region.

Description.—In general shape resembling *E. hancocki.* Carapace narrower, more octagonal. Front more advanced but less elevated. Subhepatic tooth obtuse-angled. Posterolateral angles thickened and rounded. Posterior lobes very shallow, separated by a broad and very slight indentation. Cardiac region with a small hollow in a circular rim, facing obliquely backward. Chela less swollen than in *hancocki.*

Measurements.—Male holotype, length of carapace 6.3, width 6.7 mm.

Range.—Known only from the unique specimen.

EBALIA CRISTATA Rathbun

FIGURE 35; PLATE 35, FIGURES 8, 9

Nursia tuberculata RATHBUN, Proc. U. S. Nat. Mus., vol. 16, p. 257, 1893 (type locality, Gulf of California; type, U.S.N.M. no. 17503); not *E. tuberculata* Miers, 1881.

Ebalia cristata RATHBUN, Proc. U. S. Nat. Mus., vol. 21, p. 612, pl. 44, fig. 5, 1898 (type locality, off Abreojos Point, Lower California; type, U.S.N.M. no. 21599).

TABLE 41.—*Material examined of* Ebalia hancocki

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
	° ′ ″	° ′ ″									
MEXICO: Socorro Island: Braithwaite Bay.			40			Jan. 4, 1934	132	*Velero III*	1♀ ovig	69279	Hancock Galapagos Exped.
ECUADOR: Galapagos Islands	*Latitude S.* 00 55 00	90 30 00	58–60			Jan. 26, 1934	190	do	2 ♀	69760	Do.
James Island: Sullivan Bay			5–20			Jan. 23, 1934	177	do	2 ♀	69276	Do.
Do	Near Albany Island		50–70			Jan. 24, 1934	183	do	1 ♂ 2 ♀	69275	Do.
Albemarle Island: Tagus Cove	30 miles S. of cove		30			Jan. 13, 1934	147	do	3 ♂ 4 ♀	69278	Do.
Do	S. of point		12–15			do	148	do	2 ♂ 3 ♀	69280	Do.
Do	In channel		80–100			Jan. 15, 1934	156	do	1 ♀	69744	Do.
Do	In cove		10–18			do	157	do	1 ♀ ovig	67273	Do.
Charles Island	01 03 33	90 17 30	56			Feb. 5, 1933	55	do	1 ♀ ovig	67988	Holotype, Hancock Galapagos Exped.
Do	Post Office Bay		8–10			Jan. 27, 1934	193	do	1 ♂	69762	Hancock Galapagos Exped.
Do	Off point		35–40	rky		Jan. 29, 1934	197	do	2 ♀	69274	Do.
Chatham Island	E. of Wreck Bay		35–40			Jan. 21, 1934	171	do	2 ♀	69277	Do.
Do	do		32			do	170	do	2 ♀ ovig	69333	Do.
Hood Island: Gardner Bay	W. of the bay		25–35			Jan. 31, 1934	201	do	1♂2♀ovig	69281	Do.
South Seymour Island	Velero Bay		5			Jan. 22, 1934	173	do	1♀ y	69761	Do.

Diagnosis.—Carapace octagonal; front entire; chelipeds cristate.

Description.—Length and breadth of carapace subequal; hepatic regions depressed; deep furrows outline cardiac and mesogastric regions. A blunt median carina extends from the front to the cardiac region. Surface covered with flat close-set granules, not quite so large on the anterior third. Front truncate, upturned. A blunt prominence at hinder end of hepatic region; directly behind it a triangular lobe or tooth on the margin of the branchial region, fol-

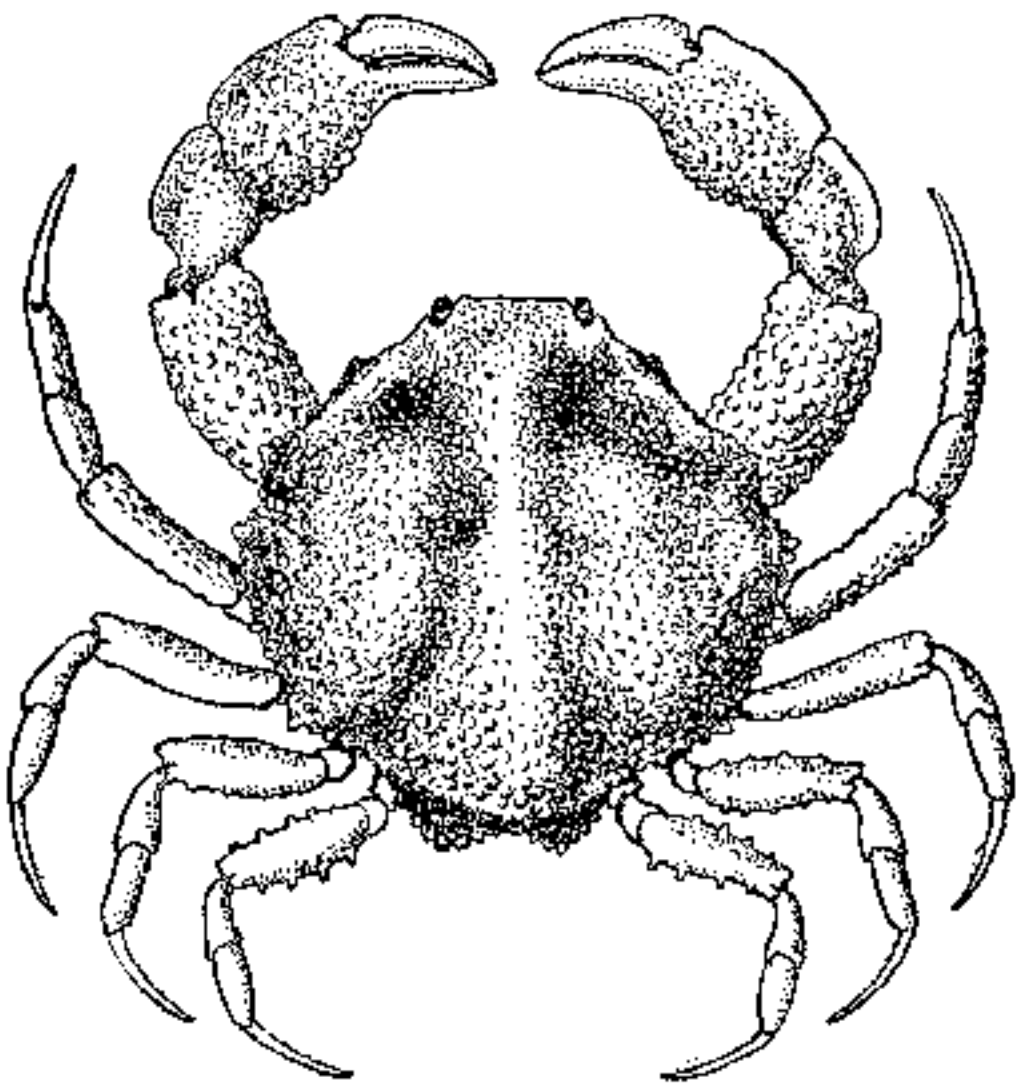


FIGURE 35.—*Ebalia cristata*, male holotype (21599): Dorsal view, × 3½.

lowed closely by a smaller, similar lobe at the widest part of the carapace, both lobes inclined downward; posterolateral angle furnished with an acute denticle; behind it the margin is concave; posterior margin with two shallow adjacent lobes. Of the dorsal branchial prominences, the anterior one is the highest; below it a ridge trends toward the midlateral tooth; the prominence behind it is irregularly broken up. In a larger male, these prominences are more confluent. Pterygostomian region drawn to an acute point. Merus of chelipeds cylindrical, length less than twice thickness; carpus, propodus, and dactylus with a thin, acute crest; palm swollen, lower margin convex. Legs granulate, margins spinulous; dactyls long, slender, fringed below.

Measurements.—Male (17503), length of carapace 11.8, width 12.5 mm; male (21599), length 9.6, width 10 mm.

Range.—West coast of Mexico.

Material examined.—Lower California, Mexico:

Off Abreojos Point; lat. 26°14′00″ N., long. 113°13′00″ W.; 48 fathoms; yl. M.; temperature 53.9° F.; May 3, 1888; station 2834, *Albatross;* 1 male (21599).

Off Angel de la Guardia Island, Gulf of California; lat. 29°30′00″ N., long. 112°40′00″ W.; 45 fathoms; 1880–82; Comdr. H. E. Nichols, U. S. N.; 1 male (17503).

EBALIA ROTUNDATA (A. Milne Edwards)

Plate 36, Figures 9–12; Plate 37, Figures 4, 5

Lithadia rotundata A. Milne Edwards, Bull. Mus. Comp. Zool., vol. 8, p. 22, 1880 (*type locality, mouth of the Bermejo, Patagonia; type, M. C. Z. no. 6662*).—A. Milne Edwards and Bouvier, Mem. Mus. Comp. Zool., vol. 27, p. 113, pl. 22, figs. 6, 7; pl. 23, figs. 1, 2, 1902.

Diagnosis.—Carapace octagonal, without lateral teeth. Carapace hollowed out about cardiac region.

Description.—Surfaces everywhere covered with flat, adjacent granules delimited by raised lines; on the digits, especially those of the ambulatories, the granules are replaced by spinules. Carapace wider than long, octagonal, sides unequal, margins thick. Front narrow, faintly bilobed. The anterolateral margins are the longest and have two obtuse prominences, one at level of hepatic region, the other more feeble and a little behind; lateral margins half as long as anterolateral, converging posteriorly and slightly concave; posterolateral margins a little longer than the preceding and also concave; posterior margin twice as wide as front, having a broad sinus and two shallow lobes, more pronounced in male. The branchial regions are the most elevated portions of the carapace. The hepatic region is very convex above and below; not toothed below but more prominent in female than in male; dorsally it is surrounded by a depression. Cardiac prominence wider than long, oblong, with rounded corners and connected by a transverse line with the urogastric region. It is otherwise surrounded by a depression, on which are some isolated mushroom-shaped granules; it is narrow and shallow behind but becomes deeper on the anterior border, where it is divided into two lobes by reason of a prominence from its outer border which projects in the direction of the anterior cardiac angle. Third and fourth segments of male abdomen with three blunt longitudinal carinae; sixth segment with an acute spine at proximal end, pointing backward. Sternum with four deep transverse grooves.

Measurements of cotypes.—Male, length 9.9, width 10.1 mm.; female, length 8.5, width 9.1 mm.

Material examined.—Known only from the two cotypes (♂ and ♀) from off Bermejo Head, Patagonia, lat. 47°17′ S., long. 63° W., 17 fathoms, March 4, 1872, station 28, *Hassler* (M. C. Z. no. 6662).

Genus LITHADIA Bell

Lithadia BELL, Trans. Linn. Soc. London, vol. 21, p. 305, 1855 (type, *L. cumingii* Bell).

Carapace subrhomboidal, with cardiac region produced posteriorly, lateral margins produced over bases of legs; surface very uneven, branchial and cardiac lobes elevated, hepatic region much depressed; the subhepatic region forms a distinct and oblique facet; surface rough with granules or tubercles. Front produced, narrow, upturned, orbits small; a considerable space between edge of lower wall of orbit and free edge of buccal cavern. Merus of external maxillipeds much more than half the length of ischium measured along inner edge; outer margin of exognath nearly straight. Chelipeds rather short and heavy. Segments 3–5 in abdomen of male fused, 4–6 of female.

This genus is restricted to those species which have marked excavations on the upper surface of the carapace.

East and west coasts of Middle America; South Africa (Stebbing), Indian Ocean (Laurie), Australia (Haswell).

KEY TO THE AMERICAN SPECIES OF THE GENUS LITHADIA

A[1]. An anterior median carina on carapace.
  B[1]. Major part of carapace excavate; highest points, 2 small lobes in line with widest part of carapace..... **cumingii** (p. 136)
  B[2]. Major part of carapace convex. Branchial region almost entirely swollen. Rostrum slightly concave..... **cadaverosa** (p. 137)
A[2]. No anterior median carina; highest point a small branchial pyramid either side in line with widest part of carapace... **granulosa** (p. 140)

LITHADIA CUMINGII Bell

PLATE 38, FIGURES 1, 2, 7–15

Lithadia cumingii BELL, Trans. Linn. Soc. London, vol. 21, p. 305, pl. 33, fig. 6, 7, 1855 (type locality, Puerto Portrero, Central America [Potrero, Costa Rica]; type in Mus. Bell).—RATHBUN, Proc. U. S. Nat. Mus., vol. 21, p. 613, 1898.

Diagnosis.—Major part of carapace excavate. Anterior median carina a single line of granules. Rostrum with two narrow arcuate lobes. Highest points of carapace two small lobes opposite widest part of carapace.

Description.—Male: Carapace very strongly marked by rude elevations, sharply circumscribing deep hollows. In a young male the elevations are more numerous and distinct, and the sulci separating them are continuous; in an old male these elevations are confluent, the sulci becoming four irregular circumscribed hollows, covered within with distinct granulations. Intermediate stages have been noted. Posterior branchial lobe forming a triangular tooth; lobes of posterior margin similarly modified. Rostrum slightly turned up, emarginate. Outer maxillipeds, sternum, and abdomen covered with distinct large and elevated granulations. The fused segment of male abdomen has a minute tooth at posterior angles and a slight

mesial carina; sixth segment oblong-quadrate, posterior margin armed with a strong tooth pointed backward. Chelipeds very irregular, arms tuberculate and granulate; hand nearly as broad as long, distinctly carinated on outer side; dactylus with a lobe at proximal end of upper carina. (After Bell.)

Female: Much broader than male; in young as well as old, the elevations are found to be as numerous as in the young male described above.

Color.—Pale brown; hollows of carapace gray; four minute red dots on abdomen. (Bell.)

Measurements.—Type male, length 18, width 15 mm. Adult female (22132), entire length 11.7, width 14 mm. Young female (22133), entire length 7.5, width 8.6 mm.

Range.—West coast of Mexico to Ecuador; 2 to 51 fathoms.

Material examined.—See table 42, page 138.

LITHADIA CADAVEROSA Stimpson

PLATE 38, FIGURES 3–6

Lithadia cadaverosa STIMPSON, Bull. Mus. Comp. Zool., vol. 2, p. 159, 1871 (type localities, west of Tortugas, 35 fathoms, and off Conch Reef, Fla., 40 fathoms; types not extant).—RATHBUN, Bull. Lab. Nat. Hist. State Univ. Iowa, vol. 4, p. 293, 1898.

Diagnosis.—A narrow median carina of granules. Rostrum slightly concave. Highest points of carapace the branchial regions which are almost entirely swollen.

Description.—Carapace broad, suboctagonal, very little produced posteriorly and strongly convex; branchial regions much swollen especially in female. These regions and the other protuberant parts of the carapace are more or less covered with depressed, often confluent granules, arranged in lines or groups with depressed spaces intervening, giving to the surface an eroded or vermiculated appearance. Excavations between regions very deep, those surrounding the cardiac region dotted with flat granules irregularly placed; those surrounding hepatic region and lying in front of branchial very narrow. Hepatic region narrow, with a granulated ridge extending inward a short distance from the anterolateral margin, which is here defined by a similar ridge. Pterygostomian prominence triangulate. Behind the hepatic region and separated from it by a deep transverse sinus below, there are on the anterolateral margin of branchial region two strong, triangular, flattened teeth pointing downward; the anterior of the two is the larger. Posterolateral tooth of branchial region triangular in male, shallower and rounder in female. Intestinal projections lobiform, shallow. One or two rows of small tubercles on lower surface of branchial region. Front thick, slightly concave. Chelipeds rugose, with angular, granulated protuberances; merus subcylindrical. Ambulatories armed above with short thick spines; last two articles somewhat setose. (After Stimpson.)

TABLE 42.—*Material examined of* Lithadia cumingii

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″									
MEXICO:											
Magdalena Bay, Lower California.	24 38 00	112 17 30	51	gn. M.		May 2, 1888	2833	*Albatross*	1♂	22133	
Off San José del Cabo	23 03 00 to 23 06 00	109 36 00 to 109 31 00	14			Aug. 4, 1932	D. 18 R.	*Zaca*; Crocker Exped.	1♂	Calif. Acad. Sci.	
Off La Paz Bay, Gulf of California.	24 18 00	110 22 00	26½	brk. Sh.		Apr. 30, 1888	2823	*Albatross*	1♀	22132	
Isabel Island	21 52 00	105 54 00	10–25			Mar. 5, 1934	277	*Velero III*	1♂1♀	69288	Hancock Galapagos Exped.
Petatlan Bay	S. and W. of White Friars Islands.		25			Mar. 2, 1934	264	do	1♀	69289	Variety. Hancock Galapagos Exped.
COSTA RICA:											
Cocos Bay, Puerto Culebra			2–4			Mar. 13, 1933	116	do	1♀y.	68004	Hancock Galapagos Exped.
Puerto Culebra	In bay		3–10			Feb. 24, 1934	254	do	1♂	69286	Do.
Do	Dredging around isles in bay.					Feb. 25, 1934	257	do	5♂2♀	69282	Do.
PANAMA:											
Secas Islands	S. of group		25	M. dead Sh.		Feb. 22, 1934	250	do	1♂1♀ 1y.	69287	Do.
Do	S. and W. of group		15	Nullipores		do	251	do	1♀	69749	Hancock Galapagos Exped. with bryozoan.
Bahia Honda	Between Medidor and Pecora Islands.		30–35			Feb. 21, 1934	244	do	1♂	69283	Hancock Galapagos Exped.
Do	Outside of isle S. of bay.		15–20			Feb. 22, 1934	249	do	1♂	69284	Do.
COLOMBIA: Gorgona Island	Near Gorgonilla (Channel).		15	M.		Feb. 12, 1934	228	do	1♀ovig	69417	Do.
ECUADOR:	*Latitude S.*										
La Plata Island				Dredged		Jan. 22, 1933	23	do	1♀	68003	Do.
Do	N. of anchorage		7–10	rky.		Feb. 10, 1934	213	do	2♂	69285	Do.
James Island, Galapagos	Sullivan Bay		5–20			Jan. 23, 1934	177	do	1♂	69418	Do.

TABLE 43.—*Material examined of* Lithadia cadaverosa

Locality	Bearings						Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.			Longitude W.											
	°	′	″	°	′	″			° F.						
FLORIDA:															
SW. of Cape San Blas	29	18	15	85	32	00	25	crs. gy. S. brk. Sh		Feb. 7, 1885	2370	*Albatross*	1♂	17855	
Do	29	15	30	85	29	30	27	G		do	2372	do	1♀	17854	
NW. of Tortugas	25	44	32	83	21	15	34	fnc. S	69	Mar. 11, 1889	5088	*Grampus*	1♂1♀	18202	
BAHAMAS: Bahama Banks										May 18, 1893		State Univ. Iowa Bahama Exped.	1♀	S. U. I	

Color.—Bluish white, with flake-white ridges and tubercles; frontal portion and feet flesh colored; a few blood-red spots on abdomen and about bases of appendages especially of chelipeds. (Stimpson.)

Measurements.—Male (17855), length of carapace 7.5, width 8 mm; female (17854), length 7.4, width 8.6 mm.

Range.—West coast of Florida to Bahamas; 25–34 fathoms.

Material examined.—See table 43, page 139.

LITHADIA GRANULOSA A. Milne Edwards

FIGURE 36

Lithadia granulosa A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 22, 1880 (type locality, off St. Croix Island, 115 fathoms; whereabouts of type unknown).—A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 27, p. 116, pl. 22, figs. 8, 9; pl. 23, figs. 3–5; pl. 24, fig. 1, 1902.

Diagnosis.—No linear median carina of granules. Major part of carapace convex; highest point a small branchial prominence either side of middle and opposite widest part of carapace. A large rectangular pterygostomian prominence, anterior margin transverse. Front truncate.

Description.—Branchial regions very large, dominating the longitudinal rounded prominence which attaches the truncate front to the cardiac region; they present in the forward part a little outside the median line a high pyramidal prominence; farther outward an oblique but lower protuberance of the same form on the strong branchial arch; its summit is advanced almost to line of lateral margin. Cardiac area a rounded but very depressed pyramid, surrounded by a narrow, shallow depression where the unevenness of the granules is accented. Below the hepatic areas, little prominent and of small size, there is a conspicuous rectangular pterygostomian projection; behind this a small subbranchial tooth. The raised line of granules forming the anterolateral border is, in the hepatic region, divided into two curves, which form between them a very obtuse angle. Anterolateral angle of branchial region triangular and separated by an arched line from posterolateral angle; this is rounded, as are the two halves of the intestinal region. Female abdomen strongly discoid, its fused segment a little wider than long; telson subtriangular, margins arcuate.

Granules of carapace depressed, unequal, confluent, forming a sort of mosaic; they are also grouped in prominent lines as on the lateral border of hepatic region and at divers points on branchial and cardiac regions. On lower surface of branchial region and on sternal plastron outside the abdomen certain granules are irregularly placed and protuberant above the others, giving the surface a corroded appearance. A similar disposition occurs on the free face of the abdomen, but the granules are larger and the differences of level less pronounced. On the ischium of the outer maxillipeds the granules form on the median line a strong longitudinal elevation.

The granules of the other appendages are in general smaller than those of the carapace, but some frequently project above the others in an obtuse point; this is the case in the merus of chelipeds and on the three middle articles of the legs; the dactyl of the latter appendages is ornamented with stiff hairs. Granules form a swelling on upper border of wrist and also terminate the upper beveled edge of the palm. (After A. Milne Edwards and Bouvier.)

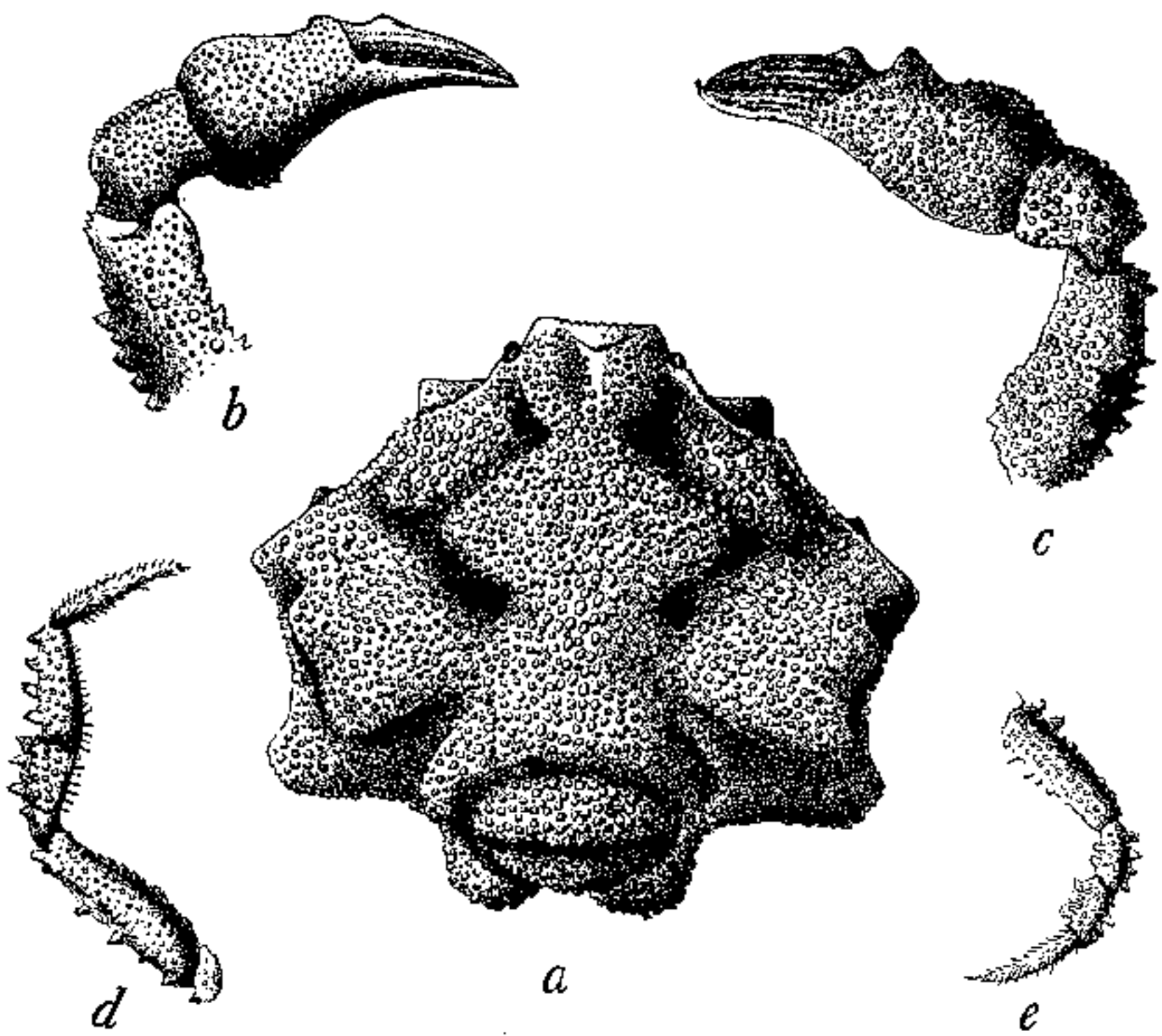


FIGURE 36.—*Lithadia granulosa:* *a*, Carapace of female, dorsal view; *b*, left cheliped, inner face; *c*, same, outer face; *d*, first right ambulatory, outer face; *e*, last right ambulatory, outer face. ×7½. After A. Milne Edwards and Bouvier.

Measurements.—Holotype female, length 7, width 8.1 mm.

Range.—Known only from the type specimen, from off Fredericksted, St. Croix Island, West Indies; 115 fathoms; R. brk. Sh.; temp. 65° F.; station 132, *Blake*, 1878–79.

Genus SPELOEOPHORUS A. Milne Edwards

Speloeophorus A. MILNE EDWARDS, Ann. Soc. Ent. France, ser. 4, vol. 5, p. 148, 1865 [type, *S. nodosus* (Bell)].—RATHBUN, Bull. U. S. Fish Comm. for 1900, vol. 20, pt. 2, p. 88, 1901.

Carapace broad, roughly pentagonal, hexagonal or octagonal; lateral borders considerably prolonged over the base of the legs. Posterior half with a deep cavity in either branchial region which is roofed wholly or in part by a bridge formed by an extension of the cardiac region meeting a similar extension of the branchial region

along a suture line. Suborbital border entire. Endognath of outer maxillipeds overreaching exognath, which has a rounded extremity. Eyes large. Chelipeds short and strong. Abdomen of male with segments 3–5, of female with 4–6 fused; in male a backward-pointing spine on sixth segment.

To this genus are referred all of the *Ebalia* or *Lithadia* species having deep hollows or caves within the posterior half of the carapace. North Carolina to Cape St. Roque, Brazil; west coast of Mexico.

KEY TO THE SPECIES OF THE GENUS SPELOEOPHORUS

A¹. The deep cavity of the carapace has only two orifices, invisible in dorsal view.
- B¹. Carapace hexagonal ..... **nodosus** (p. 142)
- B². Carapace trigonal ..... **schmitti** (p. 143)

A². Carapace octagonal and with four orifices, of which two are visible in dorsal view.
- B¹. Carapace broader than long.
  - C¹. Dorsal pair of orifices small. Carapace highest at anterior end of branchial elevation ..... **pontifer** (p. 144)
  - C². Dorsal pair of orifices large. Carapace highest near middle of branchial elevation; narrower than *pontifer* ..... **elevatus** (p. 145)
- B². Carapace longer than broad, strongly constricted behind frontal margin. Superior orifices circular ..... **digueti** (p. 148)

SPELOEOPHORUS NODOSUS (Bell)

PLATE 40, FIGURES 1–5

Oreophorus nodosus BELL, Trans. Linn. Soc. London, vol. 21, p. 307, pl. 33, fig. 8, 1855 (type locality unknown; type in Brit. Mus.).

Speloeophorus nodosus A. MILNE EDWARDS, Ann. Soc. Ent. France, ser. 4, vol. 5, p. 149, 1865.—RATHBUN, Bull. U. S. Fish Comm. for 1900, vol. 20, pt. 2, p. 89, 1901.—HAY and SHORE, Bull. U. S. Bur. Fisheries, vol. 35 (1915–16), p. 425, pl. 32, fig. 4, 1918.

Spelaeophorus nodosus STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 10, p. 119, 1871.—RATHBUN, Ann. Inst. Jamaica, vol. 1, p. 37, 1897.

Diagnosis.—Carapace pentagonal or hexagonal, broader than long. Only two orifices in hinder half of carapace; orifices are posterior and invisible in dorsal view.

Description.—Carapace about one-fifth broader than long, pentagonal, intestinal region concealed in dorsal view, posterolateral angles rounded; surface covered with crowded granules and nodose; an elevated protuberance on hepatic region, a transverse line of nodules across middle of carapace and one above each posterior cavity; a median ridge on gastric region. In a large specimen the nodules are fused, those over the cavities forming two large coils. Cavities large, invisible in dorsal view. Carapace of ♂ much more uneven than that of ♀. Hepatic region thick, margin rounded; pterygostomian region with a prominent bunch of granules; anterolateral branchial margin with two similar bunches of granules; posterolateral lobe and upper part of cavity sharp-edged. Posterior

margin of intestinal region bilobed, lobes more distinctly marked in ♂ than in ♀. Front thick, bilobed. Entire lower surface granulate. Outer margin of arm irregularly bilobed, distal lobe the larger; hands *dilated, outer margin cristate; fingers thin, flat, grooved. Legs* cristate, crests dentate or narrowly lobed.

In one small ♂ (19361), the anterior angles of the cardiac region are not joined closely by the branchial surface, resulting in two small orifices, which lead into the large cavities.

Color.—Like dead piece of coral overgrown with purplish and greenish algae and patches of red ones. Hands perhaps of a natural greenish cast; reticulations around whitish areas greenish or pale bice green; above articulation of fingers faint vinaceous-pink; fingers dull china white. Legs dirty white, merus with whitish spots and greenish reticulations and with vinaceous median cross bar, as have also carpus and propodus across middle of upper side. Eyes not distinguishable from rest of coloration of body. Under parts dirty whitish, abdomen greenish, darker in pits; markings much as in Hay's photograph (*loc. cit.*), perhaps vinaceous-cinnamon. Eggs transparent drab color, with black eye.

Habit.—*Very readily plays dead.*

Measurements.—Male (19362), length 12.2, width 14.8 mm.; female (55191), length 17, width 21.7 mm.

Range.—North Carolina to Puerto Rico; 1½ to 10 fathoms.

Material examined.—See table 44, page 146.

SPELOEOPHORUS SCHMITTI Glassell

PLATE 40, FIGURES 6, 7; PLATE 41, FIGURES 1, 2

Speloeophorus schmitti GLASSELL, Trans. San Diego Soc. Nat. Hist., vol. 8, no. 14, p. 95, pl. 10, 1935.

Diagnosis.—Carapace trigonal, much broader than long. Two large posterior orifices, invisible in dorsal view.

Description.—Length of carapace about two-thirds of width; posterior margin nearly straight to the outer end where it forms a large, arcuate lobe on the side, which is nearly half as long as the carapace; a little farther forward on the margin a small blunt lobe or tooth, followed by a broad, shallow, triangular lobe extending to the branchiohepatic sinus. Hepatic region prominent, defined by a broad shallow groove; subhepatic region sharper, conical, appearing a little more than a right angle from above. Carapace laterally very convex and a little uneven; covered with flat, crowded granules; a small transverse elevation on anterior branchial region. Posterior hollows large, openings rhomboidal. The two blunt frontal lobes are separated by a depression, from which a single line of raised granules extends backward some distance on the gastric region. The under side of the body and the appendages are very rough. Palms bluntly carinate; merus with three stout conical, blunt lobes on upper surface.

Two lobules on merus of ambulatories, and a double row of unequal, denticulate teeth on carpus and propodus.

Measurements.—Female holotype, length of carapace to tip of frontal teeth 27.1, width 36.8 mm.

Range.—West coast of Mexico.

Material examined.—Gulf of California, Mexico:

San Felipe; May 6–15, 1933, H. N. Lowe, 2 females (one is holotype) (67728); S. A. Glassell; 2 males (Glassell collection).

Angeles Bay; under dense bed of sea lettuce at low tide; January 4, 1932; S. A. Glassell; 2 males, 1 female (Glassell collection).

Peñascosa, Sonora; February 1934; H. N. Lowe; 1 male (69400).

SPELOEOPHORUS PONTIFER (Stimpson)

PLATE 39, FIGURES 1–3

? *Ebalia fossa* DESBONNE, MS., *in* Desbonne and Schramm, Crustacés de la Guadeloupe, etc., p. 55, 1867 (type locality, Guadeloupe; type perhaps not extant).

Lithadia pontifera STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 10, p. 115, 1871 (type locality, Barbados; type not extant).—RATHBUN, Bull. U. S. Fish Comm. for 1900, vol. 20, pt. 2, p. 88, 1901.

Ebalia (*Lithadia*) *cubensis* VON MARTENS, Arch. für Naturg., vol. 38, p. 114, pl. 5, fig. 9, 1872 (type locality, Bay of Rio de Janeiro; type in Berlin Mus.).

Spelaeophorus triangulus A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 23, 1880 (type localities, Charlotte Harbor and Sand Key, Fla.; type from Sand Key in M. C. Z., no. 6667).—A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 27, p. 120, pl. 24, figs. 3, 4, 1902.

Speloeophorus pontifera HAY and SHORE, Bull. U. S. Bur. Fisheries, vol. 35 (1915–16), p. 425, pl. 32, fig. 5, 1918.

Diagnosis.—Carapace octagonal, broader than long. Two pairs of orifices, one posterior partially visible from above, the other smaller, dorsal, and situated at anterior angle of cardiac region. Carapace highest at anterior end of branchial elevation.

Description.—Carapace distinctly broader than long, with an angular outline, the sides projecting considerably over the bases of the legs. Surface covered with granules, the larger ones forming a finely reticulated pattern. The lobe at the inner angle of the branchial region is the highest part of the carapace; its summit is transversely ridged. Side margins of carapace thick. Hepatic region small and slightly elevated, with an incomplete circle of granules above, and an interrupted line on outer margin. Pterygostomian region prominent, with a conical downward-pointing spine, visible from above. A small tooth on anterior part of anterolateral margin of branchial region. Posterolateral margins rectangled, the outer portions of which are subparallel but bayed inward, forming a subacute tooth anteriorly and a rounded lobe posteriorly; the width of the carapace may be greatest at one or the other of these angles. Between cardiac and branchial regions on either side, a deep cavity bridged over by the meeting of a projection from the cardiac region

with a similar projection from the posterior branchial protuberance, and leaving a small dorsal cavity on either side of urogastric region. Posterior margin thinner than anterior and lateral margins on account of the deep excavation around cardiac region; intestinal region faintly bilobed. Front elevated, thick, bimarginate, a deep sinus across middle. Chelipeds somewhat cristate, forming a lobe at distal end of manus. Ambulatory legs granulate and tuberculate. Abdomen densely tuberculate; segments 3–5 only partially fused; segment 6 with a sharp, backward-pointing spine at proximal end.

Color.—In the middle pale red, remainder white (von Martens).

Measurements.—Male (24519) length 6, width 7.5 mm.; female (17853), length 10.3, width at middle of carapace 13.4 mm.

Range.—Beaufort fishing banks, North Carolina, to Barbados; low tide to 125 fathoms.

Material examined.—See table 45, page 147.

SPELOEOPHORUS ELEVATUS Rathbun

PLATE 39, FIGURES 7–9

? *Ebalia mamillosa* DESBONNE, MS., *in* Desbonne and Schramm, Crustacés de la Guadeloupe, etc., p. 54, 1867 (type locality, Guadeloupe; type perhaps not extant).

Speloeophorus elevatus RATHBUN, Bull. Lab. Nat. Hist. State Univ. Iowa, vol. 4, p. 290, pl. 3, fig. 1, 1898 (type locality, off Key West; type in Mus. S. U. I.); Proc. U. S. Nat. Mus., vol. 21, p. 612, 1898.

Diagnosis.—Carapace broader than long, narrower than in *pontifer*. Two pairs of orifices of good size, narrowly separated. Carapace highest near middle of branchial elevation.

Description.—Carapace narrower and higher than in *S. pontifer;* the highest point is at middle of ridge defining inner and posterior boundary of each branchial region. Hepatic region convex; pterygostomian tooth stout, blunt. Branchial region with three lateral lobes, one on anterolateral margin, the others on lateral margin, the lobe at posterolateral angle much the largest and most produced. The posterior orifices are each nearly as large as the cardiac lobe; the anterior orifices are each about half as large as the posterior and separated from them by narrow, cylindrical bridges; surface between anterior openings much depressed. Outer surface of merus of cheliped with stout, blunt lobes; palm swollen laterally, its outer margin thick and smooth. Upper surface of crab covered with depressed granules so crowded as to present a honeycomb structure; the more elevated portions are in addition tuberculated. On the lower surface are many more tubercles, large and beadlike, tending to form on the abdomen reticulating lines. Tubercles margining ambulatory legs acorn-shaped.

Measurements.—Type female, length 9.7, width at posterolateral angles 12 mm.

Range.—From Florida Keys to Cape St. Roque, Brazil.

Material examined.—See table 46, page 147.

TABLE 44.—*Material examined of* Speloeophorus nodosus

Locality	Bearings		Depth	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
	° ′ ″	° ′ ″	*Fathoms*		° *C.*						
NORTH CAROLINA: Off Morehead City.			2	Dredged		July 14, 1913		*Fish Hawk*	1	51079	
FLORIDA: Off Pepperfish Key.	29 19 30	83 46 00	10	S. Co	18.3	Nov. 20, 1901	7158	do	1 ♀	55191	
Tortugas	E. of fort landing dock, Fort Jefferson.			From *Porites*		July 22, 1930	28	W. L. Schmitt	1 ♀	66526	Gift of Carnegie Institution.
			Feet								
Do	Toward N. end of shoal on which Loggerhead Key stands.		10	About a great patch of massive corals.		June 13, 1925	374	do	Fragments of 1.	66573	Gift of Carnegie Institution. From fish stomach no. 374, yellow grunt, *Haemulon sciurus*.
Do	S. of deep channel giving access to Garden Key docks from the west.		Less than 10.	do		June 18, 1925	438	do	do	66574	From stomach of same species, no. 438. Gift of Carnegie Institution.
JAMAICA: Port Royal								P. W. Jarvis	1 ♂	19362	
Jamaica								do	2 ♂	19361	
PUERTO RICO: Mayaguez Harbor.	Custom House NE. ¾ E., 4½ mi.; Tangent of land S. abt. Point Melomas, 11 mi.		4–6	Co	20	Jan. 20, 1899	6065	*Fish Hawk*	1 ♀	24520	
ST. THOMAS									1 ♂	Copenhagen Mus.	
GUADELOUPE									1 ♀y	Geneva Mus.	

TABLE 45.—*Material examined of* Speloeophorus pontifer

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
	° ′ ″	° ′ ″									
NORTH CAROLINA: SE. of Cape Fear.	33 38 00	77 36 00	15	crs. yl. S. brk. Sh. rot. Co.		Oct. 20, 1885	2619	*Albatross*	1♀	11354	
FLORIDA:											
Key Largo			Low tide	Among coral-lines.		1885		H. Hemphill	1♀	17853	
Tortugas	About 9 mi. S. of SW. channel buoy.		20	crs. S. Sh		Aug. 16, 1924	7	Waldo L. Schmitt	1♀	66512	Gift of Carnegie Institution.
Off Charlotte Harbor.			13			Apr. 19, 1872		*Bache*	1♀ y	Paris Mus.	
Off Sand Key			125			Apr. 13, 1872	5	do	1♂	6667, M.C.Z.	Type of *S. triangulus*.
Florida(?)			7–10						1♀ immature.	42225	Deposited by Union College.
CUBA									1♀	Berlin Mus.	Type of *Ebalia* (*Lithadia*) *cubensis*.
PUERTO RICO: Off Culebra Island.			15¼	Co. S		Feb. 8, 1899	6087	*Fish Hawk*	1	24519	

TABLE 46.—*Material examined of* Speloeophorus elevatus

Locality	Bearings		Depth	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
FLORIDA:	° ′ ″	° ′ ″	*Feet*								
S. of Long Key, Tortugas			5–6			Aug. 5, 1924		W. L. Schmitt	1♂	66524	Gift of Carnegie Institution.
Off Key West			Shallow water.			June 26, 1893	46	State Univ. Iowa Bahama Exped.	1♀	S. U. I.	Type.
JAMAICA: Port Antonio								Institute of Jamaica	1	Mus. Inst. Jamaica, Kingston.	
	Latitude S.		*Fathoms*								
BRAZIL: Off Cape St. Roque	6 59 30	34 47 00	20	brk. Sh		Dec. 16, 1887	2758	*Albatross*	1♀	22131	

SPELOEOPHORUS DIGUETI (Bouvier)

PLATE 39, FIGURES 4–6

Lithadia digueti BOUVIER, Bull. Soc. Ent. France, 1898, p. 330 (type locality, Gulf of California; type in Paris Mus.).

Diagnosis.—Carapace longer than broad; a well-marked constricted neck. Two pairs of orifices; dorsal ones circular, surrounded by five stout lobes, four branchial, one cardiac. Four prominent, triangular, posterior lobes, two branchial, two intestinal.

Description.—Carapace longer than wide, everywhere covered with unequal, flattened granules, almost touching, scarcely prominent; on the elevated parts the granules are stronger and irregular, giving the surface a corroded appearance. Front truncate, hollowed out at middle, and inclined strongly upward; behind the obtuse carina which limits this inclined part, there is a broad, prominent, longitudinal swelling, which widens behind under the form of a small mesogastric triangle; it is regularly concave, due to the elevation of the front. Hepatic tubercles strong and almost pyramidal; they form the outer limit of a deep, irregular depression which extends to the branchial area and the median swelling. Branchial elevations very high and irregular; their highest point is a large subpyramidal prominence, which is found in the neighborhood of the cardiac area; they are a little less elevated in front and present here three or four irregular and slightly corroded bosses; an arcuate swelling connects the outermost of these bosses with the posterior part of the hepatic tubercle; below this swelling the carapace is very inclined and forms a coarsely granulate facet which is continued behind to the postero-lateral angle. This last is very prominent, broad, obtuse, and directed backward and outward; it is attached to the hepatic tubercle by an S-shaped lateral border. Subhepatic tubercle slightly visible in dorsal view. The cardiac region forms an obtuse and very outstanding prominence which does not conceal the two large lobes of the intestinal region; it sends outward a broad prolongation which is soldered to, and forms a wide bridge with, a corresponding branchial area. Between the inner orifices of these two bridges the carapace is strongly depressed.

Ocular peduncles short. Antennular fossettes very oblique; orbital fissures completely closed. Opercular part of outer maxillipeds equally granulous throughout. Chelipeds subcylindrical, covered with obtuse granules; a tubercle on outer surface of merus, a row of three on outer surface of palm, bordered on either side by a longitudinal sulcus. Legs ornamented with large tubercles, obtuse or spiniform, on upper border of merus, carpus and propodus; also some spinules on lower border of propodus. Abdomen of male with a prominent row of tubercles on median line, also a lateral row on

segments 3 and 4; a conical, sharp, downward-pointing spine at proximal end of segment 6.

Measurements.—Male (66515), length of carapace 17, width of same 16 mm.

Female.—A small specimen (69750) 6.7 mm long by 6.3 wide, is probably the young female of *S. digueti.* The striking protuberances of the male are replaced by slight ones; the median cardiac lobe is low, as is also the marginal lobe beneath it, which has a slight groove. The front is relatively shorter and less constricted than in the male.

Range.—West coast of Mexico to Panama.

Material examined.—As follows:

Mexico: Carmen Island, Gulf of California; 20 fathoms; December 19, 1931; 1 male; S. A. Glassell collector and owner. Acapulco; April 1930; H. N. Lowe; 1 male (66515).

Panama: Secas Islands; south and west of group; 25 fathoms; nullipores; February 22, 1934; Hancock Galapagos Expedition; station 251; 1 female young (69750).

Genus UHLIAS Stimpson

Uhlias STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 10, p. 117, 1871 (type, *U. ellipticus* Stimpson).

Carapace broadly elliptical, sides much expanded, depressed, laminiform, middle elevated; front nonprojecting; eyes concealed beneath orbital margin of carapace. Exognath of outer maxillipeds not tapering. Propodi of ambulatory legs expanded, dactyli short. East and west coasts of middle America.

KEY TO THE SPECIES OF THE GENUS UHLIAS

A¹. Ambulatory legs subcheliform ..... ellipticus (p. 149)
A². Ambulatory legs not subcheliform ..... limbatus (p. 150)

UHLIAS ELLIPTICUS Stimpson

PLATE 36, FIGURES 1, 2

Uhlias ellipticus STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 10, p. 117, 1871 (type locality, Panama; type not extant).

Diagnosis.—Carpal and propodal articles of ambulatories cristate, the latter forming a process below against which the dactylus closes, giving a subcheliform appearance. Bottom of pits on carapace not granulate.

Description.—Upper surface of carapace, with the exception of the central parts and the lateral expansions, covered with deep, rounded, or elongated pits. The posterior pits are the largest, and six of them, of a pentagonal or rounded shape, are situated on the posterior part of the branchial regions, three on each side. A large transverse pit occupies the entire width of the intestinal region, following the poste-

rior margin. The pits on frontal and hepatic regions are elongated in a direction parallel with the longitudinal axis of the body. Entire surface, except bottoms of pits, granulate. Margins slightly waved but nowhere distinctly toothed. Frontal margin thick, eyes small, firmly embedded in their sockets. Intestinal margin straight. Chelipeds and feet granulate; chelipeds short, with a crest on merus and one on hand. Ambulatories compressed, with a laminiform crest on merus and two similar crests on carpus and propodus; the propodus is broadly expanded below, forming a process against which the short dactylus retracts, thus giving a subcheliform appearance to the extremities.

Measurements.—Female type, Panama, length of carapace 5, breadth 7.9 mm.

Range.—Mexico to Ecuador and Galapagos Islands.

Material examined.—San Jose Island, Gulf of California, Mexico; December 10, 1931; S. A. Glassell; 1 female (Glassell coll.).

Galapagos Islands; *Velero III*, Hancock Expedition, 1933: Cartago Bay, Albemarle Island, February 13, 2 females (68261); Darwin Bay, Tower Island, February 22, 1 female (68259).

UHLIAS LIMBATUS Stimpson

PLATE 36, FIGURES 3–5

Uhlias limbatus STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 10, p. 118, 1871. (type locality, St. Thomas; type not extant).—RATHBUN, Ann. Inst. Jamaica, vol. 1, p. 38, 1897.

Diagnosis.—Carpal and propodal articles of ambulatories flattened above, not cristate; extremities not subcheliform. Bottom of pits on carapace granulate.

Description.—Carapace, chelipeds and legs closely granulate. Carapace moderately convex except toward the sides, which are strongly projecting. Hepatic region limited from the branchial region by an inconspicuous closed fissure. Cardiac region surrounded except in front by a deep furrow which posteriorly follows the hind margin of carapace. A deep circular pit on posterior part of branchial region; swollen part of carapace surrounded on the sides by a shallow concavity which deepens at its posterior extremity on branchial region. Lateral margins waved but not distinctly toothed. Posterior margin slightly convex. Merus of cheliped subtrigonal, not lobate; manus very thick, lower margin convex, upper edge thin. Third to fifth segments of male abdomen coalesced, proximal portion of this compound segment with a median sulcus, surface swollen on either side, anterior portion rising in a low median tubercle; penult segment in the shape of a short hourglass; terminal segment triangular, longer than broad, reaching a little into the buccal cavity.

Measurements.—Female, type, St. Thomas, length of carapace 5.6, breadth 8.1 mm; male (55203), length 4.6, breadth 6.7 mm.

Range.—Florida Straits to St. Thomas.

Material examined.—As follows:

Florida: Smith Shoal, west of Key West; 4 to 5 fathoms; *Fish Hawk;* 1 female (55204). Key West harbor; temp. 73.5° F.; December 20, 1912; station 7793, *Fish Hawk;* 1 male (55203).

Cuba: Point Colorado, lat. 22°05′ N., long. 84°21′ W.; 2 to 3 fathoms; Sh. Grs.; station 10; Henderson and Bartsch; *Tomas Barrera* expedition; 1 female (48522).

Jamaica: P. W. Jarvis; 1 male (19425).

Haiti: East coast of; lat. 19°09′50″ N., long. 69°21′40″ W.; 35 fathoms; February 16, 1933; station 53, Johnson-Smithsonian Expedition; 1 female (67823).

Subfamily PHILYRINAE, new name

Leucosiinae ALCOCK, Journ. Asiatic Soc. Bengal, vol. 65, p. 165, 1896 (part).
Iliinae (part) and Leucosiinae IHLE, Die Decapoda der *Siboga*-Expedition, Monogr. 39b², p. 205, 1918.

Carapace almost hemispherical, surface only slightly uneven. The so-called frontal teeth are often well-developed inner-orbital angles. A median frontal tooth may be present. Infraorbital lobe seldom well developed, and usually the roof of the efferent branchial channel reaches the same level. Epistome mostly reduced. The margins of the mouth and of the pterygostome are chiefly or entirely in the same transverse plane. Merus of external maxillipeds half or more than half the length of the ischium measured along the inner border. The first abdominal segment in female is often under the carapace.

Genus PERSEPHONA Leach

Persephona LEACH, Zoological miscellany, vol. 3, pp. 18, 22, 1817 [type, *P. latreillii* Leach, 1817=*Cancer punctatus* Linnaeus, 1758 (partim)].
Guaia MILNE EDWARDS, Histoire naturelle des Crustacés, vol. 2, p. 127, 1837 [type, *Cancer punctatus* Linnaeus, 1758 (partim)].

Carapace ovoid or globular, terminating posteriorly in three spines—*two on the border and one median higher up.* Surface smooth or granular, regions not all demarcated. Front well delimited from remainder of carapace; the dentiform prolongations of the septa of the branchial channels project beyond it. Hepatic region, the side wall of which commonly forms a distinct facet, generally separated from branchial region by a broad notch in anterolateral margin. Orbits deep, concealing the retracted eye; three sutures in roof and outer wall very distinct; the floor coincides with roof of buccal cavern. Antennae loosely lodged in gap at inner canthus of orbit. Antennules folded obliquely. Buccal cavern elongate; the

acutely triangular merus of external maxillipeds is half or a little more than half the length of ischium measured along inner edge; the second article of the exognath has the outer margin more or less curved. Chelipeds rather massive. Abdomen of male with segments 3–5 fused, of female with 4–6 fused.

New Jersey to Brazil; Lower California, Mexico, to Chile.

KEY TO THE SPECIES OF THE GENUS PERSEPHONA

A¹. Less than seven spines or teeth on posterior and lateral margins of carapace.
  B¹. Only three spines on carapace.
    C¹. Subhepatic margin angled. Carapace subcircular.
      D¹. A broad blunt tooth at subhepatic angle. Granulation fine. Front slightly produced.....**punctata punctata** (p. 152)
      D². A granule at subhepatic angle. Granulation coarse. Front prominent.....**punctata aquilonaris** (p. 154)
    C². Subhepatic margin arcuate, not angled.
      D¹. Carapace subcircular; length and breadth equal, exclusive of spine. Palm of female less than twice as long as wide..... **edwardsii** (p. 154)
      D². Carapace suboval, longer than broad, exclusive of spine. Palm nearly three times as long as wide..**subovata** (p. 158)
  B². Only five spines or teeth on carapace; a spine or tooth at subhepatic angle.
    C¹. Subhepatic spine or tooth of male short, acute, dentiform.....**orbicularis** (p. 160)
    C². Subhepatic spine of male long, cylindrical.....**townsendi** (p. 160)
A². More than five marginal spines or teeth or tubercles, one of which is at widest part of carapace.
  B¹. Seven lateral and posterior spines. Carapace slightly wider than long, spines excluded.....**lichtensteinii** (p. 163)
  B². Nine lateral and posterior spines, teeth or tubercles; a tooth between subhepatic angle and widest part of carapace. Carapace longer than wide, spines excluded.
    C¹. Nine excrescences short, tuberculiform.....**crinita** (p. 163)
    C². Seven spines, two tubercles.....**finneganae** (p. 161)

ANALOGOUS SPECIES OF PERSEPHONA ON OPPOSITE SIDES OF THE CONTINENT

ATLANTIC	PACIFIC
punctata punctata.	*subovata.*

PERSEPHONA PUNCTATA PUNCTATA (Linnaeus)

PLATE 42, FIGURES 2, 3

Guaia alia species? MARCGRAVE, *in* Piso and Marcgrave, Historia rerum naturalis Brasiliae, p. 182, 1648.

Three thorned Crab BROWNE, The civil and natural history of Jamaica, p. 422, pl. 42, fig. 3, 1756.

Cancer punctatus LINNAEUS, Systema naturae, ed. 10, vol. 1, p. 630, 1758 (part) (type localities, Asia; America). [Amboina (Rumphius) and Jamaica (Browne).] Not *C. punctatus* HERBST, Versuch einer Naturgeschichte der Krabben und Krebse, vol. 1, p. 89, pl. 2, figs. 15, 16, 1783, which is *Myra fugax*.

Cangrejo Tortugas PARRA, Descripcion de diferentes piezas de historia natural las mas del ramo maritimo, p. 137, pl. 51, fig. 2, 1787.

Cancer mediterraneus HERBST, Versuch einer Naturgeschichte der Krabben und Krebse, vol. 2, p. 150, pl. 37, fig. 2, 1794 (type locality, Mediterranean Sea [probably incorrect]).

Persephona latreillii LEACH, Zoological miscellany, vol. 3, p. 22, 1817 (locality not given) [West Indies (Bell)].[18]

Persephona lamarckii LEACH, Zoological miscellany, vol. 3, p. 23, 1817 (locality not given) [West Indies (Bell)].[18]

Guaia punctata MILNE EDWARDS, Histoire naturelle des Crustacés, vol. 2, p. 127, 1837 (type locality, Antilles).—DESBONNE and SCHRAMM, Crustacés de la Guadeloupe, etc., p. 53, 1867.

Persephona guaia BELL, Trans. Linn. Soc. London, vol. 21, p. 292, 1855; name substituted for *Guaia punctata*.

Persephona punctata STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 7, p. 70, 1859 (part: synonymy but not localities).—RATHBUN, Ann. Inst. Jamaica, vol. 1, p. 38, 1897; Bull. U. S. Fish Comm. for 1900, vol. 20, pt. 2, p. 87, 1901 (part).—BOONE, Bull. Vanderbilt Mar. Mus., vol. 2, p. 54, pl. 10, fig. B, 1930.

Persephone punctata VON MARTENS, Arch. für Naturg., vol. 38, p. 113, 1872.

In a revision of *P. punctata* it was found that the form inhabiting the United States is different from that in the West Indies and South America; there are a few instances of overlapping and therefore the latest known form is made a subspecies of the typical or southern form.

Diagnosis.—Granulation fine. Subhepatic angle a broad blunt tooth. Only 3 spines on carapace.

Description.—Carapace globular, with three sharp, stout, recurved spines, one at either end of posterior margin and one median just above posterior margin. On the upper surface of carapace are small granules of unequal size, numerous but not crowded and barely visible to the naked eye. Regions of carapace ill defined. Front broadly bidentate, the spiniform angles of the branchial channels can be seen beyond it in a dorsal view. Behind tip of front the antero-lateral boundary of carapace is formed by the side wall of the subhepatic region, which is continuous with upper surface of carapace and bounded below by a line of granules, which ends posteriorly in a shallow, blunt, obtuse-angled prominence or tooth. Between hepatic and branchial regions there is a very shallow and ill-defined sinus in margin. Above it the branchial margin begins and is marked by a line of fine, crowded, bead granules extending as far as the posterior margin, which is on a lower level and more coarsely granulate. Chelipeds rather stout, about 1.75 times the length of carapace in adult male. Arm cylindrical, tuberculate, and granulate, more coarsely above than below, and proximally than distally. Wrist and hand much smoother, very finely granulate above and below,

[18] "It is also remarkable that Leach should have been unaware that those specimens were originally in the Sloanian Collection, and therefore brought from the West Indies." Bell, Trans. Linn. Soc. London, vol. 21, p. 293, 1855.

coarsely granulate along margins. Palm nearly twice as long as wide, flattened, and a little dilated. Dactylus as long as palm and curved; prehensile edges of fingers finely denticulate, meeting for the greater part of their length. Legs stoutish; propodus of first pair reaches end of wrist; dactyli lanceolate, fringed with short hairs.

Color.—Sometimes a uniform dull blue without spots, sometimes milky white with large russet or red spots very persistent and regularly disposed on each side of the carapace. (Desbonne and Schramm.)

Measurements.—Male (23007), length of carapace on median line to tip of spine 49, width 43 mm.

Range.—West Indies to Brazil.

Material examined.—See table 47, page 155.

PERSEPHONA PUNCTATA AQUILONARIS Rathbun

PURSE CRAB

PLATE 42, FIGURES 6, 7

Persephona punctata STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 7, p. 70, 1859 (part: Florida and South Carolina; not synonymy).—RATHBUN, Bull. U. S. Fish Comm. for 1900, vol. 20, pt. 2, p. 87, 1901 (part: northern species).—HAY and SHORE, Bull. U. S. Bur. Fisheries, vol. 35 (1915–16), p. 423, pl. 32, fig. 9, 1918 (part: not all synonymy).

Guaia punctata GIBBES, Proc. 3d Meet. Amer. Assoc. Adv. Sci., p. 185 [21], 1850 (Charleston Harbor, S. C., and Georgia).

Persephona punctata aquilonaris RATHBUN, Proc. Biol. Soc. Washington, vol. 46, p. 184, 1933 (type locality, St. Augustine, Fla.; male holotype, U.S.N.M. no. 62057).

Diagnosis.—Differs from *P. punctata* as follows: Carapace more convex. Granulation coarser, plainly visible to naked eye, especially prominent on the lateral margins. Subhepatic angle small, subacute, tipped with a granule. Front narrower and more produced. Posterior margin narrower, the three posterior spines slenderer.

Color.—Grayish brown, with darker irregular spots or marmorations, the granules white or tinged with red. (Hay.)

Measurements.—Male (18013), length of carapace on median line to tip of spine 48, to base of spine 45.3, width 42 mm.

Range.—New Jersey to Texas, 2 to 17 fathoms.

Material examined.—See table 48, page 156.

PERSEPHONA EDWARDSII Bell

PLATE 45, FIGURES 3, 4

Persephona edwardsii BELL, Trans. Linn. Soc. London, vol. 21, p. 294, pl. 31, fig. 8, 1855 (type locality, Galapagos; types in Mus. Bell).—STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 7, p. 70, 1859.—BOONE, Zoologica, vol. 8, p. 284, fig. 101, 1927; not *P. edwardsii* Boone, 1930.

Diagnosis.—Three spines on carapace, forming nearly a right-angled triangle. A distinct lateral line of granules. Palms less than twice as long as wide.

TABLE 47.—*Material examined of* Persephona punctata punctata

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
JAMAICA:	° ′ ″	° ′ ″									
Harbor Head, Kingston								C. R. Orcutt	1 ♂	66652	
Jamaica								Institute of Jamaica	1 ♂	23007	
PUERTO RICO: Mayaguez						Jan. 20, 1899		*Fish Hawk*	1 y	24521	
COLOMBIA: Sabanilla						Mar. 16–22, 1884		*Albatross*	1 ♂	7565	
	Latitude S.										
BRAZIL:											
Outside Rio de Janeiro						Week of Aug. 23, 1925.		*Santa Maria* (W. L. Schmitt).	1 ♂	66459	Front unusually prominent.
Villa Bella, Ilha São Sebastião, São Paulo.						Sept. 18, 1925	#15	W. L. Schmitt	1 ♀ 1 carapace.	66460	
Do						1925		H. Luederwaldt	1 cheliped	66443	
São Sebastião						1900		Fr. Gunther	1 ♀	47843	From H. von Ihering.
Ilha Victoria, São Paulo						do		do	1 ♂	47845	From H. von Ihering. Front unusually prominent.

TABLE 48.—*Material examined of* Persephona punctata aquilonaris

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″			°F.						
NEW JERSEY	10–15 mi. SE. of Barnegat Light Vessel		12			Middle of May 1931.		Frank E. Firth	1 ♀	64490	Clinging to mackerel drift nets.
NORTH CAROLINA:											
Off Cape Hatteras	35 21 25	75 24 25	13	crs. gy. S		Oct. 19, 1884	2285	*Albatross*	3 ♂1 ♀	7236	
Do	35 21 20	75 23 50	13	crs. gy. S		do	2284	do	1 ♂	7231	
Do	35 20 50	75 19 50	16	gy. S. brk. Sh		do	2277	do	2 ♂ 7 y	8771 14311	
Do	35 20 40	75 18 40	16	gy. S. brk. Sh		do	2275	do	4 y	37961	
Do	35 20 30	75 17 30	17	gy. S. brk. Sh	72.3	do	2273	do	2 y	37976	
Do	35 20 00	75 20 00	14	M. bk. S	72	Nov. 10, 1883	2114	do	2 y	5664	
SOUTH CAROLINA:											
Charleston						1852		L. Agassiz	3 ♂3 ♀	718, M. C. Z.	
FLORIDA:											
Fernandina				Sandy beach along Atlantic.		Mar. 29, 1932		U. S. Dept. Agr.	2 ♂3 ♀	66457	
St. Augustine					°C.			Robert Ranson	1 ♂	62057	Holotype.
Hawk Channel	¼ mi. SW. by S. of Basin Hill Beacon		2	S. G	20.5	Feb. 19, 1903	7469	*Fish Hawk*	1 ♂	55211	
Off Cape Sable	25 09 52	81 21 53	3¾	gy. S. Sh	23.5	Dec. 17, 1902	7352	do	1 ♂	55187	
Do	25 10 10	81 28 30	4¾	gy. S. Sh	23.5	do	7354	do	1 ♂	55209	
Off Northwest Channel, Tortugas.	24 46 12	81 53 30	10¼	Co	19	Feb. 24, 1902	7290	do	1 ♂	55208	
4 mi. E. of Cape Romano			3			Apr. 18, 1887		Lt. J. F. Moser, U. S. N.	1 ♂	13058	
Caxambas						1919		George Mott	1 ♀	53402	
Marco								H. Hemphill	5 ♂7 ♀	17834	
Oyster Bay						May 1884		do	3 ♂5 ♀	6954	
Fergusons Pass, Oyster Bay.								do	1 ♀	17835	
Sanibel Island						Feb. 22, 1928		O. C. Van Hyning	1♂2♀		Returned to Florida State Mus.
Sanibel Beach								W. F. Clapp	6	7694, M. C. Z.	
Little Sarasota Bay								H. Hemphill	1 ♀	17837	
Sarasota Bay						Feb., 1884		do	2 ♂1 ♀	6428	
Highland	27 43 30	82 46 50	3¼	hrd. brk. Sh	15.5	Jan. 29, 1902	7261	*Fish Hawk*	1 ♀	55186	
Do	27 55 30	82 51 30	3	hrd. S. brk. Sh	15.8	Jan. 28, 1902	7249	do	2 ♂2 ♀	55188	

Anclote	Light E. ⅛ S., 14 mi.		8½	Co.	°F. 63.95	Jan. 11, 1913.	20 (7806)	do	1y	55201	
Do	28 01 30	83 03 00	8½	rky. Co.	°C. 13.4	Jan. 23, 1902.	7235	do	1 ♂	55200	
Do	28 08 00	82 57 00	5½	sdy. brk. Sh.	13	do	7229	do	1 ♀	55199	
Do	28 19 45	83 06 30	8½	rky. Grs.	13	Jan. 24, 1902.	7240	do	1 ♂ 1 ♀	55184	
North Key	29 05 00	83 22 30	5½	sdy. rky. Co.	15.5	Nov. 27, 1901.	7177	do	1 ♀	55185	
Cedar Keys	Light N. ¾ E., 21¾ mi.		5¾	Co.	°F. 63.45	Jan. 11, 1913.	21 (7807)	do	1 ♂ 1 ♀	55180	
Do						Feb., 1887		Lt. J. F. Moser, U. S. N.	1 ♀	12475	Front unusually short.
Deadmans Bay	29 24 30	83 49 30	10	R. Co.	°C. 17	Dec. 6, 1901.	7202	*Fish Hawk*	1 ♂	55210	
Pensacola								Benjamin Harrison.	1 ♂	18013	
W. Florida								Henderson and Simpson.	1 ♂	17836	
Florida								Geo. Wurdemann.	7 1 ♂	2092 45720	
Do								Bryant	1 ♂ 1 ♀	56782	From Boston Soc. Nat. Hist.
Do								Geo. Wurdemann	1 ♂ 2 ♀	720, M. C. Z.	
LOUISIANA:											
Off Breton Island						Nov., 1930		Stewart Springer	1 ♀	64146	From Caribbean Biol. Laboratories.
Grand Isle						Summer, 1930		Wm. W. Anderson	1 ♂ 1 ♀	66461	
TEXAS:											
Galveston						1871			1 ♂	6448, M. C. Z.	
Corpus Christi						1929		Mrs. Mary E. Quisenberry.	1	63031	
Do								Texas College of Arts and Industries.	1 ♂	71068	
Texas								Geo. Wurdemann	1 ♀	6446, M. C. Z.	
LOCALITY UNKNOWN									2 ♀	66458	Front unusually short.

Description (after Bell).—Carapace nearly orbicular, somewhat produced and narrowed anteriorly, minutely punctate, covered, except at the anterior portion, with very small distinct granules, of which a distinct line borders the anterolateral portion; anterior margin waved, the subhepatic angle obsolete, marked only by a slight elevation. Front broad, slightly emarginate; lateral and posterior margin much rounded, the spines placed in almost a right-angled triangle, nearly equal, recurved at apex. Chelipeds with the arm everywhere tuberculated, the wrist slightly granulated on inner side, hand minutely punctate. External maxillipeds as in *P. orbicularis*. Abdomen of female slightly granulated at posterior and lateral portions.

Color.—Pale buff (Bell). In recent alcoholic specimens, red above, bluish white below (Stimpson).

Measurements.—Type figured, length without spine 33 mm, breadth the same.

Range.—Panama (Stimpson); Galapagos Islands (Bell); Ecuador.

Material examined.—Ecuador: Cape San Francisco; 2 fathoms; off river mouth; mud and debris; February 11, 1934; Hancock Galapagos Expedition, no. 215; 1 male, 1 female, 6 young (69292).

PERSEPHONA SUBOVATA (Rathbun)

PLATE 43, FIGURES 4, 5

Myra subovata RATHBUN, Proc. U. S. Nat. Mus., vol. 16, p. 256, 1893 (type locality, *Albatross* station 3014; type, U.S.N.M. no. 17385).

Persephona subovata RATHBUN, Proc. U. S. Nat. Mus., vol. 21, p. 613, 1898.

Persephona edwardsii BOONE, Bull. Vanderbilt Mar. Mus., vol. 2, p. 53, pl. 10, fig. A, 1930; not *P. edwardsii* Bell, 1855.

Diagnosis.—Three spines on carapace. Front produced. Chelipeds long and rather slender.

Description.—Carapace perceptibly longer than broad; front produced, ascending, its convexity continued backward on carapace and accented by a depression on either side; teeth of front well marked, inner margin longer than outer. Anterolateral margin of carapace sinuous. A definite line of granules on lateral margins, visible from above. Granules of dorsum small, depressed and widely separated except on intestinal region. Posterior spines conical, subequal, the median forming an obtuse angle with lateral pair. Chelipeds narrow, in adult male three times as long as carapace minus spine; outer margin of palm nearly three times as long as wide; granules of merus larger on proximal than distal half.

Measurements.—Largest male (22136), entire length of carapace 38; without spine 34.2; width 29.2 mm.

Range.—Lower California, Mexico, to Bay of Panama; 20 to 52 fathoms.

Material examined.—See table 49, page 159.

TABLE 49.—*Material examined of* Persephona subovata

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″			°F.						
MEXICO:											
Off Abreojos Point, Lower California.	26 14 00	113 13 00	48	yl. M	53.9	May 3, 1888	2834	*Albatross*	1 ♀	22138	
Angel de la Guarda Island, Gulf of California.			20		58	Jan. 8, 1932		S. A. Glassell	1 ♀ y	Glassell coll.	
Off Tiburon Island, Gulf of California.	28 28 00	112 04 30	29	gy. S	62.9	Mar. 23, 1889	3014	*Albatross*	1 ♂ 1 ♀	17385	Types.
E. of Isabel Island	22 01 00	105 50 00	25	M		July 28, 1932	T. 4. R.	*Zaca*, Crocker Exped.	1 ♀	Calif. Acad. Sci.	
Manzanillo								H. N. Lowe	3 ♂ y	68452	
6 mi. S. by W. of Black Head.	18 33 00	103 45 00	52			July 17, 1932	T. 2. R.	*Zaca*, Crocker Exped.	2 ♂ 2 ♀	Calif. Acad. Sci.	1 ♀ soft shell.
PANAMA:											
Bay of Panama	7 57 00	78 55 00	33	gy. S. bk. Sp. brk. Sh.	64.1	Mar. 5, 1888	2795	*Albatross*	1 ♂ 1 ♀	22136	
Do	7 56 00	79 41 30	51½	gn. M		Mar. 30, 1888	2805	do	2 ♂ 1 ♀	22137 6645, M. C. Z.	

PERSEPHONA ORBICULARIS Bell

PLATE 45, FIGURES 5, 6

Persephona orbicularis BELL, Trans. Linn. Soc. London, vol. 21, p. 294, pl. 31, fig. 7, 1855 (type locality, Valparaiso; unique type in Mus. Bell).—BOONE, Bull. Vanderbilt Mar. Mus., vol. 2, p. 56, pl. 11, 1930.

Diagnosis.—Five spines on carapace, the hepatic short, stout, acute, the posterior spines slender. Carapace as broad as long, exclusive of spine, and broader in hinder half.

Description (after Bell).—Carapace orbicular, anterolateral margin slightly waved, regions rather distinct, surface somewhat punctate, with numerous minute granules, which are more thickly crowded on lateral margin and on posterior portion; front with a very slight triangular notch; subhepatic angle produced into a distinct tubercle; the three posterior spines short, acute, recurved, the upper one forming with the two inferior almost a right angle. External maxillipeds with the ischium of endognath grooved longitudinally, and in the female the inner grooved portion separated from the outer by a ciliated ridge. Chelipeds with the arm wholly tuberculated, the wrist granulated; fingers the length of the palm. Abdomen of female with the first 3 segments and the base and margin of the shield, tuberculated.

Color.—Dull yellowish, regularly mottled with dull and pale red.

Measurement.—Type female, length of carapace including spine 38.1 mm.

Range.—Perlas Islands, Panama (Boone) to Valparaiso, Chile.

PERSEPHONA TOWNSENDI (Rathbun)

PLATE 42, FIGURE 1; PLATE 43, FIGURE 1

Myra townsendi RATHBUN, Proc. U. S. Nat. Mus., vol. 16, p. 255, 1893 (type locality, *Albatross* station 3034; type, U.S.N.M. no. 17382).

Persephona townsendi RATHBUN, Proc. U. S. Nat. Mus., vol. 21, p. 613, 1898; vol. 38, pp. 594, 614, 1910.

Diagnosis.—Five spines on carapace, two subhepatic, three posterior, the median one forming a right angle with the lateral.

Description.—Male: Carapace exclusive of spine slightly longer than broad, a cylindrical spine on the subhepatic angle, the three posterior spines longer, recurved, the median spine forming a right angle with the lateral; it is also a little the longer and slightly compressed laterally. Granules on the dorsum well separated and on the gastric region few and indistinct; crowded near and below the lateral edge, where there is no single marginal line. Front with two well defined teeth, sinus broad. Granules of merus of cheliped coarse on proximal half, gradually becoming very fine on distal half. Sternum granulate except for a bare patch at base of cheliped.

Female: A little more rotund than male. Subhepatic spine more conical, posterior spines shorter.

Measurements.—Male holotype, length of carapace, spine excluded, 31, width 28 mm. Female (69291), length 34, width 32.8 mm.

Range.—From Gulf of California, Mexico, to Ecuador; 2 to 58 fathoms.

Material examined.—See table 50, page 162.

PERSEPHONA FINNEGANAE Rathbun

FIGURE 37; PLATE 42, FIGURES 4, 5

Persephona lichtensteini FINNEGAN, Journ. Linn. Soc. London, Zool., vol. 37, p. 614, fig. 2, 1931; not *P. lichtensteini* Leach, 1817, nor *P. lichtensteinii* Bell, 1855.[19]

Persephona finneganae RATHBUN, Proc. Biol. Soc. Washington, vol. 46, p. 184, 1933 (type locality, São Sebastião, Brazil; holotype male, U. S. N. M. no. 67989).

Diagnosis.—Seven strong spines, one hepatic (paired) and one at widest part of carapace (paired); of the posterior spines the median reaches half again as far back as the lateral pair.

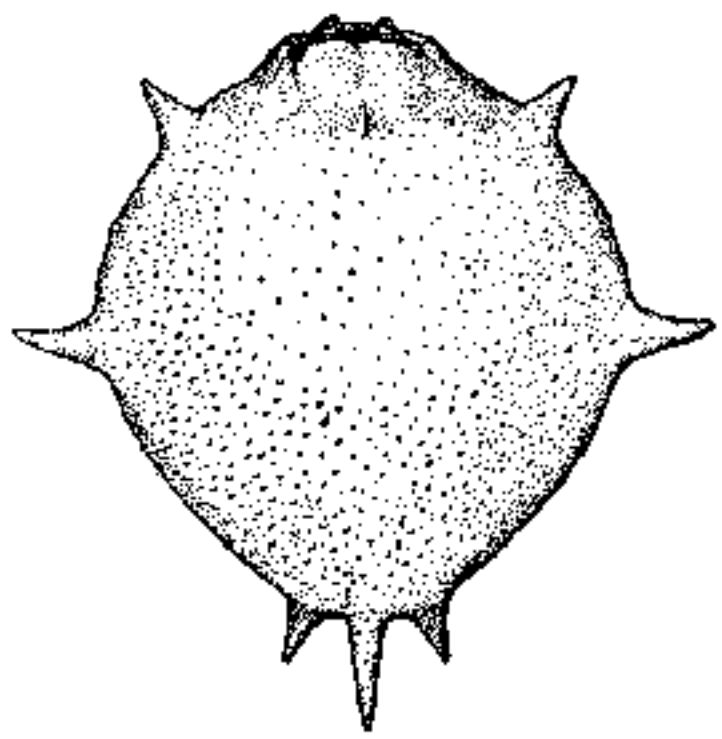


FIGURE 37.—*Persephona finneganae*, male, type (Brit. Mus.): Carapace, ×3.

Description.—Carapace, exclusive of spines, slightly longer than wide; subglobular, posterior half narrower than anterior. Surface covered with coarse, separated granules on a ground of fine, close granulation interspersed with punctae. Intestinal region partially defined by shallow furrows; two pairs of short, thumbnail, almost longitudinal indentations just behind the middle of carapace. Seven slender, acute spines; the hepatic are more triangular than the branchial spines and of subequal length; between them, but nearer the branchial spine there is a low, blunt tooth; of the posterior spines the pair on the posterior border are a little longer than the hepatic spines; the median or intestinal spine is about one and one-half times the length of the posterior lateral spines and forms a right angle with them. In a small specimen from Trinidad (66784) the median spine is longer and heavier than the other spines, being twice as long as the neighboring spines.

[19] Dr. Finnegan overlooked Bell's description and figure.

TABLE 50.—*Material examined of* Persephona townsendi

Locality	Bearings: Latitude N.			Bearings: Longitude W.			Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	°	′	″	°	′	″			°F.						
MEXICO:															
Gulf of California	30	36	30	114	27	45	24	gy. M.	63.5	Mar. 27, 1889	3034	*Albatross*	1♂	17382	Holotype.
Do	30	21	00	114	25	15	30	gy. M.	62	do	3035	do	1♂1♀	17383	
Do	29	54	30	113	01	00	58	gn. M.	61.8	Mar. 24, 1889	3017	do	1♂	17381	
Off Guaymas	27	45	00	110	45	00	20	gn. M.	65.2	Mar. 31, 1889	3037	do	1♂	17384	
E. of Isabel Island	22	01	00	105	50	00	25	M.		July 28, 1932	T. 4 R.	*Zaca*, Crocker Exped.	1♀	Cal. Acad. Sci.	
10 mi. W. of mouth of Bayona River, Sinaloa,	22	38	00	105	55	00	12–17			July 29, 1932	T. 6 R.	do	1♂	do	
Tangola-Tangola Bay, Santa Cruz.	15	46	00	96	06	00	15–20			Feb. 28, 1934	259	*Velero III*	1♀ ovig.	69291	Hancock Galapagos Exped.
PANAMA:															
Bay of Panama	8	51	00	79	31	30	7	gn. M.		Mar. 30, 1888	2800	*Albatross*	3♂ 1♂	22134 6646, M. C. Z.	
Do	8	47	00	79	29	30	14	gn. M.		do	2801	do	1♀	22135	
Do	8	38	00	79	31	30	16	gn. M.		do	2802	do	1♀	66470	
ECUADOR:															
Cape San Francisco	Off cape						2	rky.		Feb. 11, 1934	217	*Velero III*	1♀ immature.	69290	Hancock Galapagos Exped.
Do							20	Muck		do	216	do	1♂ y. soft shell.	69409	Do.

TABLE 51.—*Material examined of* Persephona finneganae

Locality	Bearings: Latitude N.			Bearings: Longitude W.			Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
HAITI:	°	′	″	°	′	″									
E. coast	19	10	20	69	29	00	17			Feb. 16, 1933	57	Johnson-Smithsonian Exped.	1♀	67806	
Do	19	10	15	69	28	05	16½			do	56	do	1♂ y.	67822	
Do	19	10	10	69	26	45	17			do	54	do	1♂	67815	
TRINIDAD: Gulf of Paria							3–6					P. H. Johnson	2♂ 1♀ y.	Brit. Mus. 66784	
BRAZIL: São Sebastião	*Latitude S.*											H. Luederwaldt	1♂ holotype 1♂ 1♀ paratypes.	67989 Mus. Paulista.	

Measurements.—Male holotype, entire length of carapace 37, length without spine 34, entire breadth 37, breadth without spines 32.2 mm. Male (Trinidad), length 17.5, breadth 17, spines excluded (Gordon *in litt.*).

Range.—West Indies to Brazil. 3 to 17 fathoms.

Material examined.—See table 51, page 162.

PERSEPHONA LICHTENSTEINII Leach

PLATE 45, FIGURES 1, 2

Persephona lichtensteinii LEACH, Zoological miscellany, vol. 3, p. 23, 1817 (type locality not given; types, male and female, in Brit. Mus.).—BELL, Trans. Linn. Soc. London, vol. 21, p. 293, pl. 31, fig. 6, 1855. Not *P. lichtensteini* Finnegan, 1931.

Diagnosis.—Three posterior spines of good length, forming an equilateral triangle. A short tooth at subhepatic angle and another at middle of lateral margin. Arm wholly granulate.

Description (after Bell).—Carapace orbicular, depressed, sparsely granulated; subhepatic angle produced into a prominent tubercle or tooth; another on lateral margin on each side; between them is a row of 10 large contiguous bead granules; three posterior spines equal, so placed as to form the points of an equilateral triangle. Front broad, nearly straight. External maxillipeds with the inner stalk in the male nearly plain, with only a slight longitudinal groove; in the female more deeply grooved toward inner margin. Chelipeds more slender than in *punctata, orbicularis,* and *edwardsii;* arm wholly covered with tubercles, very large at proximal end, becoming much smaller at distal end; a line of granules on outer side of wrist.

Measurements.—Length of carapace of male 26, width 26.4 mm, spines excluded (Gordon *in litt.*).

Range.—Known only from 2 specimens, male and female, in British Museum; female is type (Leach). Locality not known.

PERSEPHONA CRINITA Rathbun

PLATE 43, FIGURES 2, 3; PLATE 44, FIGURES 1–3

Persephona crinita RATHBUN, Journ. Washington Acad. Sci., vol. 21, p. 128, pl. 2, 1931 (type locality, Horn Island Pass, Miss., about 3 fathoms; holotype male and paratype female, *U. S. N. M.* no. 63739).

Diagnosis.—A tubercle on lateral margin at middle or widest part; another less than halfway to hepatic protuberance. No definite marginal line.

Description.—Male: Carapace slightly longer than broad, more convex from side to side than anteroposteriorly; front little produced; hinder end with three similar, short, conical spines, the median one forming an angle not much in excess of a right angle. Dorsal surface covered with a dense coating of short, hooked hairs that conceal the small and widely separated bead granules; granulation denser near lateral and posterior borders and continued on lower

surface of carapace where it is finer behind the hepatic region. A granular tubercle on subhepatic protuberance and two on lateral margin, one of which is at widest point of carapace and the outer anterolateral. Front almost transverse, forming a very wide V, median sulcus deep.

Outer maxillipeds sparingly granulate, inner two-thirds of ischium smooth. Chelipeds narrow, less than twice as long as carapace, pubescent; merus slightly constricted near carpus, coarsely granulate except for a smooth patch on the distal two-fifths above and below. Carpus and manus finely granulate along outer margin; dactylus a little longer than outer margin of manus. Legs pubescent above on merus, carpus and propodus; dactylus fringed with hair on either side. Sternum coarsely granulate, interstices pubescent. Abdomen very narrow, first three segments granulate.

Female: Lateral tubercles less prominent than in male, obsolescent; lateral posterior spines farther apart, forming a greater angle with median spine; posterior margin more produced at middle.

Measurements.—Male holotype, length of carapace 22.3, width 21.6 mm; female paratype, length 24, width 22.8 mm.

Range.—Gulf of Mexico to Brazil; 3 to 34 fathoms.

Material examined.—See table 52, page 165.

Genus MYROPSIS Stimpson

Myropsis STIMPSON, Bull. Mus. Comp. Zool., vol. 2, p. 156, 1871 (type, *M. quinquespinosa* Stimpson).—A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 21, 1880.

Carapace subglobular, narrowed anteriorly; cardiac and intestinal regions defined; five posterior spines. The anterior extremity of the septa of the branchial channels does not extend beyond orbits. Basal article of antennules indurated and crested. Chelipeds very long and slender. Male abdominal segments 3–6 fused.

Massachusetts to Venezuela.

MYROPSIS QUINQUESPINOSA Stimpson

PLATE 46, FIGURES 1–3

Myropsis quinquespinosa STIMPSON, Bull. Mus. Comp. Zool., vol. 2, p. 157, 1871 (type localities, Tennessee Reef, Florida Keys, 21 and 82 fathoms; types not extant).—A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 21, 1880.—A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 27, p. 110, 1902.

Myropsis constricta A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 21, 1880 (type locality, Barbados, 100 fathoms; type in M. C. Z.).—A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 27, p. 110, pl. 21, figs. 4–6; pl. 22, figs. 1–5, 1902.

Myropsis goliath A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 21, 1880 (type locality, Cariacou, Windward Islands, 163 fathoms; type in M. C. Z.).—A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 27, p. 111, pl. 21, figs. 1–3, 1902.

TABLE 52.—*Material examined of* Persephona crinita

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″			°F.						
MISSISSIPPI: Horn Island Pass			About 3			Aug. 20, 1930		Stewart Springer	1 ♂ 1 ♀	63739	Types. From Caribbean Biol. Laboratories.
Off Horn Island						do		do	2 ♂ 2 ♀	64254	From Caribbean Biol. Laboratories.
LOUISIANA: Grand Isle						Summer, 1930		Wm. W. Anderson	1 ♂ 1 ♀	66468	
DATA UNOBTAINABLE						June 25, 1913	7927	*Fish Hawk*	1 ♂	66467	Beam trawl.
TRINIDAD, BRITISH WEST INDIES: Chacachacare Bay (probably).			20–25			Feb. 1878		Crosby	1 ♀ y., soft shell.	66466	From Boston Soc. Nat. Hist.
Gulf of Paria	10 37 00 to 10 37 40	61 42 40 to 61 44 22	31–34	dk. slate-col. M.	67–73	Feb. 3, 1884	2121–2122	*Albatross*	1 ♀ y., soft shell.	20328	
	Latitude S.										
BRAZIL: Ilha São Sebastião, São Paulo.						1915		E. Garbe	1 ♀	934, Mus. Paulista	

Diagnosis.—Three tubercles on anterolateral margin, one at widest part of carapace, one hepatic, one between the two. Front bidentate. Five posterior spines.

Description.—Body and appendages everywhere granulated except the ambulatory dactyls. Carapace, exclusive of spine, a little longer than wide; intestinal and cardiac regions defined by rather deep furrows on either side; hepatic region slightly swollen; cervical sulcus partially defined at hepatic region; granules of surface distant from one another by spaces equal to two or three times their diameter; anterolateral margin slightly sinuous. Of the five posterior spines, the median one is intestinal; the intermediate pair is marginal and in the adult equally long and more evenly conical; the outer pair very small, with tip strongly upturned, is situated on the branchial region over the insertion of the posterior legs. There is a tubercle at middle of lateral margin and another on the hepatic margin; also between the two and directly behind the hepatic suture a small granulated tubercle. Frontal teeth elevated, tips subacute.

Merus of chelipeds cylindrical, longer than carapace exclusive of spine, granules densely crowded; granules of hand smaller, also crowded; hand broader than thick, upper face nearly three times as long as wide; fingers longer than palm, armed within with minute and acute teeth varying in size. Ambulatory feet naked (except dactyli), cylindrical, and microscopically granulated; those of first pair one and two-thirds times as long as carapace; dactyli with two fringes of hair on upper and outer surface.

Variation.—In size of granules, especially noticeable on the anterior part of the undersized type of *M. constricta*, which in no other way differs from the average *quinquespinosa*. In immature specimens the median spine is usually longer than the posterior marginal pair.

In one specimen from off Puerto Rico the spines of the posterolateral pair are longer than those of the posterior pair and intermediate in length between the posterior pair and the median spine, the latter being longer than in typical specimens.

Color.—Yellowish white with a very delicate pinkish tint in legs and pincers; light brownish yellow on first joints of legs. Pure white beneath. (Henderson.) Buff to buff yellow on proximal and distal extremities of leg articles and margins of carapace; front between eyes darker, almost orange-ochraceous. (W. L. Schmitt.)

Measurements.—Male (66484), length of carapace 45.6, width 40; length of cheliped, outer edge, 106 mm. Largest male (Caracas), length from tip of frontal tooth to middle of posterior margin, 68.2; from median sinus to tip of median spine, 71.8, width 65 mm. (Copenhagen Mus.).

Range.—Massachusetts to Venezuela. 50–572 fathoms.

Material examined.—See table 53, page 168.

Genus PHILYRA Leach

Philyra LEACH, Zoological miscellany, vol. 3, p. 18, 1817 [type, *P. scabriuscula* (Fabricius, 1798) = ? *Cancer cancellus* Herbst, 1783].

Carapace usually circular and somewhat depressed, dorsal surface generally bounded by a continuous beaded line; hepatic and branchial regions usually fairly well defined. Front broad, truncate, the whole or the greater part of the edge of buccal cavern being seen beyond it in dorsal view. Buccal orifice transversely oblong, with anterior angles broadly rounded; exognath broadly dilated, outer and anterior borders forming parts of one wide curve; merus of endognath narrowly and acutely triangular, length of inner border not much less than that of the broad ischium. Orbits small and sunken, with 2 sutures in upper wall, and a hiatus at inner angle, where the minute antennal flagellum stands; antennules folding transversely. Chelipeds symmetrical and, relatively to the legs, very massive; legs small. Abdomen of male consists of three or four pieces, that of the female of four. (After Alcock.)

With one exception, known only from the waters of the Eastern Hemisphere.

PHILYRA PISUM De Haan

PLATE 47, FIGURES 1, 2

Philyra pisum [*pisun*, by error] DE HAAN, Fauna Japonica, Crustacea, p. 131, pl. 33, fig. 7, 1841 (type locality, Japan; type not located).—BELL, Trans. Linn. Soc. London, vol. 21, p. 300, 1855.—ORTMANN, Zool. Jahrb. (Abt. Syst.), vol. 6, p. 582, pl. 26, fig. 16, 1892.—CALMAN, Ann. New York Acad. Sci., vol. 11, p. 262, 1898.

Diagnosis.—Front little shorter than epistome; pterygostomian region medially angulate; carapace granulate; chela of male exceeding carapace by half its length; fingers with five longitudinal sulci, inner margin denticulate.

Description.—Length and breadth of male subequal, length greater than breadth in female. A median carina of granulated tubercles on gastric region; granules sparsely scattered on carapace, especially on branchial and gastric regions. A raised granulate line on lateral and posterior margins; posterior margin truncate in male, slightly arcuate in female, terminating in obtuse angles. Front with shallow emargination. Exognath finely granulate; sternum of male smooth except on margins. Chelipeds minutely granulate, granules interspersed with short, smooth, transverse lines; margins coarsely granulate; merus broadest at middle, almost smooth below. Segments 3–6 of male fused, sutures not wholly obliterated.

Color.—Dark olivaceous.

Measurements.—Male (17564), length 22, breadth 22.3 mm; female (17564), length 19, breadth 18.2 mm.

Range.—Japan; Korea; Philippines; Puget Sound, one specimen (Calman; whereabouts of specimen undetermined).

TABLE 53.—*Material examined of* Myropsis quinquespinosa

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
MASSACHUSETTS:	° ′ ″	° ′ ″			°F.						
SE. of Marthas Vineyard.	40 01 00	69 56 00	76	hrd. S. M.	52	Aug. 4, 1881	941	*Fish Hawk*	1 ♂	39987	
SW. of Marthas Vineyard.	40 03 48	70 45 54	69	gn. M. S.	52	July 16, 1881	922	do	1 claw	34049	
NORTH CAROLINA:											
Between Capes Hatteras and Lookout.	34 38 30	75 33 30	124	S. R.		Oct. 18, 1885	2602	*Albatross*	1 y	11231	
SE. of Cape Fear	33 34 00 to 33 41 00	76 41 00	115	S. Sh.	°C. 21.9	Dec. 12, 1919	20037	do	1 ♀ ovig	55181	Otter trawl.
FLORIDA:					°F.						
Off Cape Canaveral	27 58 30	78 24 00	572	For.	41.2	May 3, 1886	2656	do	1 ♂	11382	
Fowey			80			1916	354	J. B. Henderson	1 y	66474	
Do			75-100			1917	361	do	4 y	66473	
Do			95			do	362	do	1 y	66475	
Do			75-90			do	364	do	1 y	66476	
Ragged Key, E			75-90			do	366	do	1 y	66471	
Ajax Reef			70-90				370	do	1 y	66472	
Tortugas Reef								do	1 y	55212	
Tortugas	About 15 mi. S. of no. 2 red buoy.					July 23, 1924	41	W. L. Schmitt	2 y	66478	Gift of Carnegie Institution.
Do	About 13 mi. S. of no. 2 red buoy.		80			July 13, 1930	10	do	1 ♀ ovig	66483	Color noted. Gift of Carnegie Institution.
Do	About 14 mi. S. of no. 2 red buoy.		80-60			July 15, 1930	12	do	5 ♂ 4 ♀ (3 ovig.)	66485	Otter trawl. Gift of Carnegie Institution.
Do	About 15 mi. S. of no. 2 red buoy.		110			do	14	do	1 ♂ 1 ♀	66799	Do.
Do	About 13 mi. S. of no. 2 red buoy.		80-100			July 29, 1930	35	do	2 ♂ 2 ♀	66482	Do.
Do	About 16 mi. S. of no. 2 red buoy.		117			Aug. 3, 1931		do	2 ♀ y	66477	Do.
Do	About 10 mi. S of no. 2 red buoy.		50	Stiff, heavy mud		Aug. 7, 1931		do	1 ♂ 1 ♀ y	66481	Do.
Do	About 13 mi. S. of no. 2 red buoy.		72-60			June 26, 1932	21	do	2 ♂ 1 ♀; 1 carapace	66484	Do.
Do	About 16 mi. S. of no. 2 red buoy.		125-65			June 30, 1932	25	do	5 ♂	66487	Do.

Do	About 13 mi. S. of no. 2 red buoy.			83–91				July 23, 1932	59	do	3 ♂ 2 ♀	66486	Do.
Do	About 16 mi. S. of no. 2 red buoy.			130–112				Aug. 5, 1932	72	do	1 ♂ y	66479	Do.
Do	About 12 mi. S. of no. 2 red buoy.			66–60				do	73	do	1 ♂ 1 ♀ y	66480	Do.
NW of Tortugas	25	33	00	101			61¾	1877–78	45	*Blake*	1	2682, M.C.Z.	
W. of Charlotte Harbor	26	31	00	119				do	50	do	1 y	3056, M.C.Z.	
SE. of Sand Key Light				61						J. B. Henderson	1 ♂	55213	
Sand Key SE. by E				75						do	Frags. of 2 y	67751	
S. of Sand Key				70				May 1913		do	1 ♀ ovig	46037	
Off Western Dry Rocks				65						do	1 ♀ y	66812	
SW. of Cape San Blas	28	44	00	85	16	00	60	gy. S.		Mar. 15, 1885	2404	*Albatross*	1 y	21695
Do	28	42	30	85	29	00	88	gy. M.		do	2403	do	3 y	17841
Do	28	36	00	85	33	30	111	gy. M.		Mar. 14, 1885	2402	do	5 ♂ 11 ♀	9761
SE. of Choctawhatchee Bay.	28	38	30	85	52	30	142	gn. M. brk. Sh.		do	2401	do	4 ♂ 1 ♀	17840
Do	28	41	00	86	07	00	169	gy. M.		do	2400	do	1 ♀	17839
ALABAMA: S. of Mobile Bay	29	14	30	88	09	30	68	gy. M.		Feb. 11, 1885	2378	do	3 ♀ 3 y	17838 2924, M.C.Z.
MEXICO: Campeche Bank	23	13	00	89	16	00	84		60	1877–78	36	*Blake*	1 ♂ 1 ♀ 6 y 1 ♀ ovig	3055, M.C.Z. 6658, M.C.Z.
WEST INDIES:														
Cuba; SE. of Santiago de Cuba.	19	56	25	75	49	49	175	gy. M. S. brk. Sh.		Feb. 27, 1884	2130	*Albatross*	1 ♂	6922
Jamaica; off entrance to Port Royal.							100			Apr. 28, 1880		*Blake*	1 ♂	4458, M.C.Z.
Puerto Rico:														
N. of	18	31	30	66	14	55	120			Mar. 8, 1933	105	Johnson-Smithsonian Expedition.	1 ♂	67818	Variety.
Off W. coast	18	24	45	67	14	15	80–180			Feb. 9, 1933	35	do	1 ♂	67805
LESSER ANTILLES:														
Martinique							170			1878–79	206	*Blake*	1	2925, M.C.Z.
Barbados							100			Dec. 27–30, 1871		*Hassler*	1 ♂ 1 ♂	6659, M.C.Z. Paris Mus.	Figured type of *M. constricta*. Cotype of *M. constricta*.
Do							82	Co. S. brk. Sh.	64½	1878–79	293	*Blake*	1 ♂ 1 ♀	do	*M. constricta*.
Grenadines: Cariacon							163			do	241	do	1 l. ♀ 1 ♀	do 6661, M.C.Z.	Type of *M. goliath*. Paratype of *M. goliath*.
Grenada							92	Co. brk. Sh.	58½	do	253	do	Fragments of carapace	2926, M.C.Z.	
VENEZUELA: Caracas													1 ♂	Copenhagen Mus.	Labeled "*M. goliath*."

Genus LEUCOSILIA Bell

Leucosilia BELL, Trans. Linn. Soc. London, vol. 21, p. 295, 1855 [type, *L. jurinei* (Saussure)].

Carapace orbicular, subglobose, front with two divergent teeth; intestinal region unidentate. Antennular fossae oblique, hollowed out of the frontal teeth. Three orbital fissures. Exognath of outer maxillipeds slightly curved, margins parallel, apex obtuse. Chelipeds robust, of medium length. Abdomen of male with segments 3–5 coalesced, penult segment unispinous; abdomen of female broadly ovate, strongly convex.

West coast of America; Indian Ocean.

LEUCOSILIA JURINEI (Saussure)

PLATE 48, FIGURES 1–8

Guaia (*Ilia*) *jurinei* SAUSSURE, Rev. Mag. Zool., no. 8, p. 65 [12], pl. 13, fig. 4–4b, 1853 (type locality, Mazatlan, Mexico; type in Geneva Mus.).

Leucosilia jurinii BELL, Trans. Linn. Soc. London, vol. 2, p. 295, pl. 32, fig. 1, 1855.—STIMPSON, Boston Journ. Nat. Hist., vol. 6, p. 471, 1857; Ann. Lyc. Nat. Hist. New York, vol. 7, p. 69 [23], 1859.

Leucosilia jurinei RATHBUN, Proc. U. S. Nat. Mus., vol. 38, p. 552, pl. 45, fig. 1, 1910.—BOONE, Zoologica, vol. 8, p. 283, fig. 100, 1927; Bull. Amer. Mus. Nat. Hist., vol. 58, p. 583, fig. 18, 1929.

Diagnosis.—Surface everywhere granulate; carapace without spines. A short protuberance on intestinal region, two prominences on hepatic region.

Description.—Carapace convex, sides rounded, surface covered with large contiguous granules except on the frontal and part of the hepatic regions, which are covered with a pavement of minute flattened granules. A low, blunt elevation on hepatic, a triangular prominence on subhepatic region. A stout tubercle or tooth on the intestinal region; posterior margin curved, slightly projecting. Abdomen of male very long; penult segment shorter than terminal one, its spine overlapping the fused segment; abdomen of female with a broad central carina. Abdomen and sternum coarsely granulate. Chelipeds half as long again as carapace, arm coarsely granulate, wrist and chela finely so; palm short and thick, fingers slightly curved, armed with small denticles on the inner edge; tips crossing.

Measurements.—Male (20672), length of carapace 20, width 18.2 mm; female (39102), length 17.5, width 17.6 mm.

Range.—West coast of Mexico to Peru; Galapagos Islands.

Material examined.—As follows:

Mexico: West coast; Forrer collector; 1 male, 1 female (6725, Berlin Mus.).

Nicaragua: Realejo; Örsted collector; 1 male (20672), 2 males (Copenhagen Mus.). Corinto; J. A. McNiel; 2 females (6449, M. C. Z.).

Costa Rica: Punta Arenas; P. Biolley; February 1907; 2 males, 2 females (39102); gift of J. Fid Tristan.

Panama: *Hassler* Expedition; 2 females (6450, M. C. Z.). Pearl Islands, Panama Bay; S. Garman; April 1875; 1 male (6451, M. C. Z.).

Peru: Oyster beds of Matapalo (near Capon); R. E. Coker; January 23, 1908; 1 male, 1 female (40444); gift of Peruvian Government.

Genus RANDALLIA Stimpson

Randallia Stimpson, Proc. Boston Soc. Nat. Hist., vol. 6, p. 85, 1857 (type, *R. ornata* Randall); Boston Journ. Nat. Hist., vol. 6, p. 471, 1857.—Miers, Voyage of H. M. S. *Challenger*, Brachyura, vol. 17, p. 316, 1886.—Alcock, Journ. Asiat. Soc. Bengal, vol. 65, p. 191, 1896.

Carapace circular and convex, almost globular; front narrow, usually broadly bidentate, and somewhat sunk behind the level of the front edge of buccal cavern. Subhepatic or pterygostomian regions convex and puffed out. A broad vertical interval between the orbits and the edge of buccal cavern. Surface of carapace usually covered with vesicular or pustulous granules, but these are sometimes visible only with a lens. Regions usually, but not always, distinctly demarcated by grooves. Posterior margin generally, but not always, armed with spines or petaloid lobules or tubercles. Upper edge of orbits deeply emarginate, a wide gap at inner canthus, and three very distinct sutures in the upper-outer wall. The antennules fold obliquely; antennae loosely lodged in the inner canthus of the orbits. Exognath not dilated, outer margin almost straight; merus of endognath about two-thirds the length of ischium measured on inner edge. Chelipeds either massive or moderately stout, of moderate length; fingers stout, less than twice as long, or nearly as long as hand, which is usually much less than half the length of carapace. (After Alcock.)

California to Peru; Pacific Islands; Indian Ocean; Curaçao; [south] Trinidad Island, Brazil; shallow water to 350 fathoms.

KEY TO THE AMERICAN SPECIES OF THE GENUS RANDALLIA

A¹. Five protuberances on posterior part of carapace, including one on intestinal region.
  B¹. Three well-separated tubercles on lateral margin of carapace, aside from the spine on posterolateral margin.
    C¹. Chelipeds of male one and one-half times as long as carapace. Carapace granulate, distinctly longer than broad ..... **ornata** (p. 172)
    C². Chelipeds of male nearly three times as long as carapace. Carapace smooth, about as broad as long ..... **laevis** (p. 177)
  B². A row of several tubercles or large granules on anterolateral margin.
    C¹. Carapace with large, globular tubercles. Edge of efferent branchial channel trilobed ..... **bulligera** (p. 176)
    C². Carapace with large granules on a background of fine ones. Edge of efferent branchial channel entire. Front produced ..... **americana** (p. 182)

A². No protuberance on median line of intestinal region.
  B¹. A smooth cap on rostrum and round plate on hepatic region ..... **minuta** (p. 179)
  B². No smooth cap on rostrum nor round plate on hepatic region.
    C¹. Four posterior lobes on carapace. Tubercles mushroom-shaped ..... **agaricias** (p. 178)
    C². No posterior lobes on carapace. Margin of efferent channel trilobed ..... **curacaoensis** (p. 182)

RANDALLIA ORNATA (Randall)

PLATE 49, FIGURES 1, 2

Ilia ornata RANDALL, Journ. Acad. Nat. Sci. Philadelphia, vol. 8, p. 129, 1839 (type locality, California; type not extant).

Guaia ornata GIBBES, Proc. Amer. Assoc. Adv. Sci., vol. 3, p. 186 [22], 1850.

Randallia ornata STIMPSON, Proc. Boston Soc. Nat. Hist., vol. 6, p. 85, 1857; Boston Journ. Nat. Hist., vol. 6, p. 471 (31), pl. 20 (not 19), fig. 3, 1857; Ann. Lyc. Nat. Hist. New York, vol. 7, p. 69 [23], 1859.—WEYMOUTH, Stanford Univ. Publ., Univ. Ser. no. 4, p. 18, pl. 1, fig. 3, 1910.—SCHMITT, Univ. California Publ. Zool., vol. 23, p. 188, fig. 116, 1921.

Diagnosis.—Carapace distinctly longer than wide. Carapace granulate. Branchiohepatic groove shallow. Two pairs of posterior protuberances triangular, acute.

Description.—Carapace slightly longer than broad; generally smooth to the naked eye but very finely granulated; posterior margin prominent, coarsely granulate and armed with two short, stout spines; above, a row of three very short, distant spines or tubercles, one intestinal, the others branchial. A row of pits defines the branchial region. Hepatic region angular, forming on obtuse tooth below; on the subhepatic or pterygostomian region there is a long, shallow, blunt lobe and behind these, but on an intermediate level, a row of three, or sometimes more, small anterolateral tubercles not far apart. Anterior part of carapace with a blunt median carina. Frontal teeth high, coarsely granulate. Basal article of antennule thin, cristate, forming an operculum covering half the fossa. Prolongation of septum of branchial channel trilobed. Chelipeds of male one and one-half times as long as carapace; merus rough with coarse granules; manus broad and thick, like the carapace smooth to naked eye; dactylus somewhat longer. Abdomen, segments 3–5 fused, 1 and 2 granulate, 2 with a spinule at either end.

In the young, granules are coarser and crowded, unequal in size. This feature is sometimes continued in larger specimens up to 33 mm long (immature female, 5167).

Color.—Carapace variegated with sanguineous spots, confluent anteriorly; chelipeds variegated with red.

Measurements.—Male (3101), length of carapace 56, width 53.2 mm.

Range.—From Mendocino County, Calif., to Magdalena Bay, Lower California, Mexico; 5½ to 51 fathoms.

Material examined.—See table 54, page 173.

TABLE 54.—*Material examined of* Randallia ornata

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
CALIFORNIA:	° ′ ″	° ′ ″			°F						
San Francisco						1880		D. S. Jordan	2♀	3115	From U. S. Fish Commission.
San Francisco Bay						Apr. 6, 1914		*Albatross*	1♂	55532	Do.
Bar outside Golden Gate						June 21, 1915		Fisherman	1♀ ovig.	66506	Do.
Monterey Bay								Mrs. Whiting	1♀	5167	Dr. Canfield's collection; variety.
Do	36 56 20	122 03 20	13	fne. S. rky		Mar. 15, 1890	3142	*Albatross*	1♀ y	18181	
Do	36 56 00	122 06 00	24	fne. gy. S. M.	53	do	3141	do	2 y	15616	Variety.
Do	36 55 30	122 02 00	19	fne. S. M. St.	55.4	do	3138	do	3 y	15615	Do.
Do	Santa Cruz Light House, N. 72° W., 8.1 mi.		10	hrd. S. R.		June 11, 1904	4562	do	1♀ y	66503	
Do	Santa Cruz Light House, N. 71° W., 2.4 mi.		10	fne. gy. S. R.		do	4560	do	1♂	66505	
Do	Point Pinos Light House, S. 21° W., 6.1 mi.		46	dk. gn. M.		May 12, 1904	4457	do	1 y	66501	
Monterey								Dr. Canfield	1♂	2547	
Do						1880		D. S. Jordan	1♂2♀	3112	From U. S. Fish Commission.
Santa Barbara						1880		do	6♂4♀	3101 46244	
Off Santa Barabara	34 20 30	119 37 50	29	fne. gy. S. M.	58.5	Feb. 11, 1889	2971	*Albatross*	2♀ y	17393	Variety.
Do	34 20 20	119 37 30	29	fne. gy. S. M.	59.1	do	2970	do	1♀ y	17392	Do.
Mugu Bay, Ventura Co.						Aug., 1923		E. P. Chace	1♂1♀ ovig.	57284	
Santa Cruz Island						Feb. 7, 1889		*Albatross*	1♀	17394	
Off Point Dume						July 25, 1914		*Anton Dohrn*	4 y	50106	From Venice Mar. Biol. Sta.
Do						do		do	1 y	50109	Variety, from Venice Mar. Biol. Sta.
Santa Monica Bay	Between Long Wharf and Venice.					Aug. 8, 1914		do	7 y	50117	From Venice Mar. Biol. Sta.
Do	Off Long Wharf, Venice.					Aug. 1, 1914		do	6 j.	50111	Variety, from Venice Mar. Biol. Sta.
Do	do					do		do	1 y	50122	From Venice Mar. Biol. Sta.
Do	SW. of Venice					July 11, 1914		do	3 y	50118	Variety, from Venice Mar. Biol. Sta.
Do	do					do		do	2 y	50165	From Venice Mar. Biol. Sta.

TABLE 54.—*Material examined of* Randallia ornata—Continued

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
CALIFORNIA—Continued.	° ′ ″	° ′ ″			°F						
Santa Monica Bay	Between Venice and Rocky Point.					Aug. 11, 1914		*Anton Dohrn*	3 y	50119	Variety, from Venice Mar. Biol. Sta.
Do	do					do		do	9 y	50107	From Venice Mar. Biol. Sta.
Near Rocky Point			12			May 10, 1924	D. 93		3 y	66497	Univ. Southern California.
Do			12			May 17, 1924			1 ♂ y. 2 ♀ y	66492	Do.
Point Vincente			8			July 5, 1924			1 ♂ 1 ♀	66495	Do.
Do			14			Nov. 15, 1924			2 y	Returned to sender	Do.
San Pedro								*Albatross*	1 ♂	21791	From stomach of *Scorpaena guttata.*
Do	500 ft. from base of breakwater.					Apr. 3, 1913	11-3	*Anton Dohrn*	3 y	50110	Variety, Venice Mar. Biol. Sta.
Do	S. of breakwater		20			Sept. 24, 1924	D105		2 y	66494	Univ. Southern California.
Do	Near Portuguese Bend.					June 23, 1914	2	*Anton Dohrn*	6 y	50105	Venice Mar. Biol. Sta.
Do	do					do	3	do	4 y	50120	Do.
Do	do					June 24, 1914	5	do	1 y	50108	Variety, Venice Mar. Biol. Sta.
Do	¼ mi. S. of big bend of Govt. breakwater.					Apr. 2, 1913	D	do	1 ♂ 18 y	50113	Venice Mar. Biol. Sta.
Off San Pedro, Point Firmin and Whites Point.						Nov. 30, 1912	4	do	1 y	50112	Do.
Do						do	3	do	1 y	50121	Do.
Off Point Firmin						Nov. 18, 1922			2 y	66500	Variety, Univ. Southern California.
Do	3 mi. S. of Point Firmin.					Nov. 29, 1912	8	*Anton Dohrn*	3 y	50123	Venice Mar. Biol. Sta.
Long Beach								H. N. Lowe	2 ♂ 2 ♀	46684	
Do			16			Oct. 3, 1925			2 ♂ y. 2 ♀ y	Returned to sender.	Univ. Southern California.
Do			24			Oct. 17, 1925			8 y	66489	Do.
Do			28			do			2 y	66490	Do.
Do	Just E. of the beach					Nov. 4, 1922			1 ♂ y	66498	Do.
Do			12			Nov. 21, 1922			1 y	Returned to sender.	Variety, Univ. Southern California.

Do					Nov. 4, 1922			1 ♂ y	66491	Univ. Southern California.
Newport		23			June 16, 1915	T109		5 y	66493	Variety, Univ. Southern California.
Do					Apr. 5, 1917			2 y	66490	Univ. Southern California.
Santa Catalina Island	To San Pedro Hill				Mar. 25, 1912		*Anton Dohrn*	4 y	50114	Venice Mar. Biol. Sta.
Do	Isthmus Harbor, from mouth of rock sculpin.				Dec. 30, 1912		do	3 ♂	50115	Do.
Do	Entrance to Catalina Harbor.				do		do	1 y	50264	Do.
Do	Catalina Harbor	30–40	sdy. M				Wm. H. Dall	2 y	17877	Variety.
Do	do	Beach					do	1 ♂	17875	Do.
Do	do				June 23, 1916			1 ♂ 1 ♀	66488	Univ. Southern California.
Do	SW. of Catalina Harbor.				do			1 ♀	66496	Do.
Do	Off the island	50					H. N. Lowe	12 y	29043	Variety.
San Nicolas Island	E. point, S. 6° W., 25 mi.	81	gy. S. Sh		Apr. 13, 1904	4422	*Albatross*	1 ♀ y	66504	
San Diego							H. A. Ward	1 ♂	6452, M. C. Z.	
Vicinity of San Diego					Feb., 1885		Rosa S. Eigenmann.	3	17876	Variety, stomach of *Sebastodes vexillaris*.
San Diego Bay	Beacon No. 3 Shoal				Mar. 1, 1904		*Albatross*	1 ♀	66507	
Off San Diego	32 33 30 | 117 16 00	36	gy. S	58.2	Jan. 26, 1889		do	1 ♂ y	17391	Variety.
Do	Point Loma Lighthouse, N. 12° W., 6.1 mi.	21	gy. S		Mar. 1, 1904	4304	do	2 y	66502	
Off Los Coronados Ids	32 28 45 | 117 16 15	36	fne. gy. S	57.3	Jan. 26, 1889	2933	do	1 ♂ y	17390	Variety.
Southern California							W. H. Dall	10 y	17878	
Do							*Anton Dohrn*	1 ♀	50116	Venice Mar. Biol. Sta.
MEXICO—Lower California:										
Off San Martin Island					Aug. 20, 1932	D. 28. R.	*Zaca*, Crocker Exped.	1 ♀	Cal. Acad. Sci.	
Playa Maria Bay					Aug. 24–26, 1896		A. W. Anthony	11 ♂ 5 ♀	19521	
Cerros Island	South Bay		10–15		Mar. 10, 1934	287	*Velero III*	1 ♂ y	69412	Hancock Galapagos Exped.
San Benito Island			20	Sh. S	Feb. 2, 1932		S. A. Glassell	1 ♀ y	Glassell coll.	
Thurloe Bay	Off Thurloe Point		8–10		Mar. 9, 1934	283	*Velero III*	1 ♀ y	69293	Do.
Do	Farther out than No. 283.		30		do	285	do	1 ♀ 2 y	69294	Do.
Off Abreojos Point	26 42 30 | 113 34 15		5½	gn. M		May 4, 1888	2835	*Albatross*	1 y	22141
Do	26 14 00 | 113 12 00		48	yl. M	53.9	May 3, 1888	2834	do	1 ♂ 1 ♀	22140
Magdalena Bay	24 38 00 | 112 17 30		51	gn. M		May 2, 1888	2833	do	4 y	22139

RANDALLIA BULLIGERA Rathbun

FIGURE 38; PLATE 50, FIGURES 1, 2

Randallia bulligera RATHBUN, Proc. U. S. Nat Mus., vol. 21, p. 614, pl. 44, fig 6, 1898 (type locality, Magdalena Bay, 12 fathoms; holotype, U.S.N.M. no. 21600); Harriman Alaska Expedition, vol. 10, p. 70, 1904.—HOLMES, Occ. Pap. California Acad. Sci., vol. 7, p. 101, 1900. (Not Weymouth, Stanford Univ. Publ., Univ. Ser. no. 4, p. 19, 1910.)

Diagnosis.—Carapace subcircular, tuberculate; tubercles large, globular, separate. Branchiohepatic groove deep. Two pairs of posterior protuberances broad and blunt.

Description.—Carapace very slightly longer than broad, dorsally covered, except on the frontal region and the branchio-hepatic,

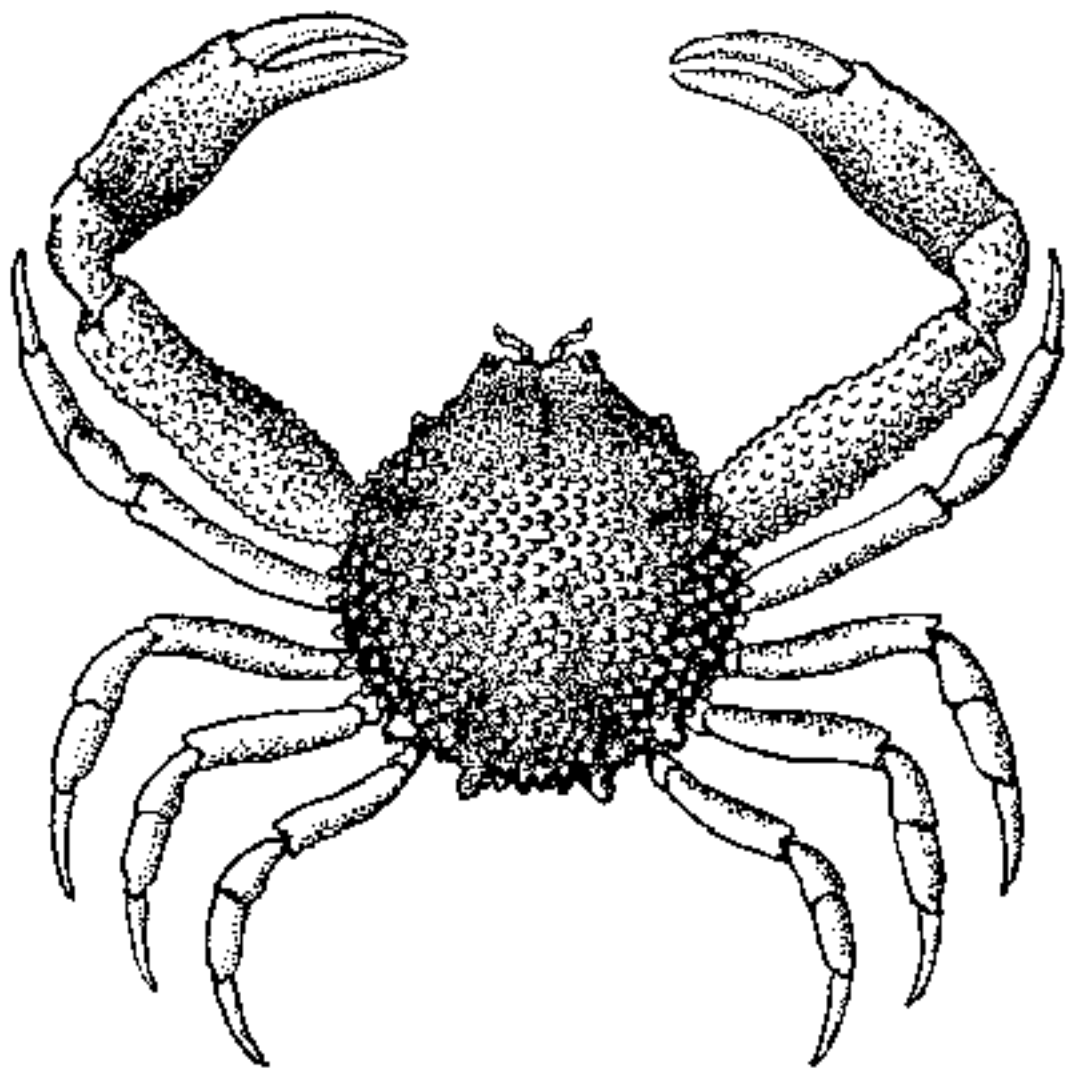


FIGURE 38.—*Randallia bulligera*, male (21600): Carapace 11.6 mm long.

cardiac, and intestinal grooves, with large, smooth, rounded, bead-like tubercles of different sizes and distinctly separated from one another; intervening space pubescent. On the median line of the intestinal region a little behind the middle, a short tubercle composed of two or three smaller ones. Four posterior lobes, two branchial, two on posterior margin; the middle two farther from each other than they are from the lateral; lobes much shorter in female than in male. Pterygostomian region with a prominent blunt tuberculated projection. Front distinctly 2-lobed. Sternum and abdomen covered with large tubercles. Maxillipeds with a longitudinal row of tubercles through the middle of endognath and exognath; anterior half pubescent. Prolongation of septum of branchial channel deeply trilobed; exognath not reaching beyond base of lobes. Merus of chelipeds covered with pointed tubercles; intervening spaces granulate; length about three-fourths the width of carapace in male, one-half in female; distal half slightly smaller than proximal. Carpus and

propodus granulate; fingers a little shorter than outer margin of palm. Legs finely granulate; dactyli with pubescent margins.

Measurements.—Male holotype: Length on median line 11.6; width 11.5 mm. *Ovigerous female: Length 12.8; width 12.6 mm.*

Range.—California to Peru.

Material examined.—See table 55, page 180.

RANDALLIA LAEVIS (Borradaile)

FIGURE 39

Persephona (*Myropsis*) *laevis* BORRADAILE, British Antarctic (*Terra Nova*) Expedition, 1910, Zool., vol. 3, no. 2, p. 107, fig. 16, 1916 (type locality, South Trinidad Island, Brazil; type in Brit. Mus.).

Diagnosis.—Chelipeds nearly three times as long as carapace. Five posterior protuberances; three short, blunt, marginal, branchial spines and one hepatic.

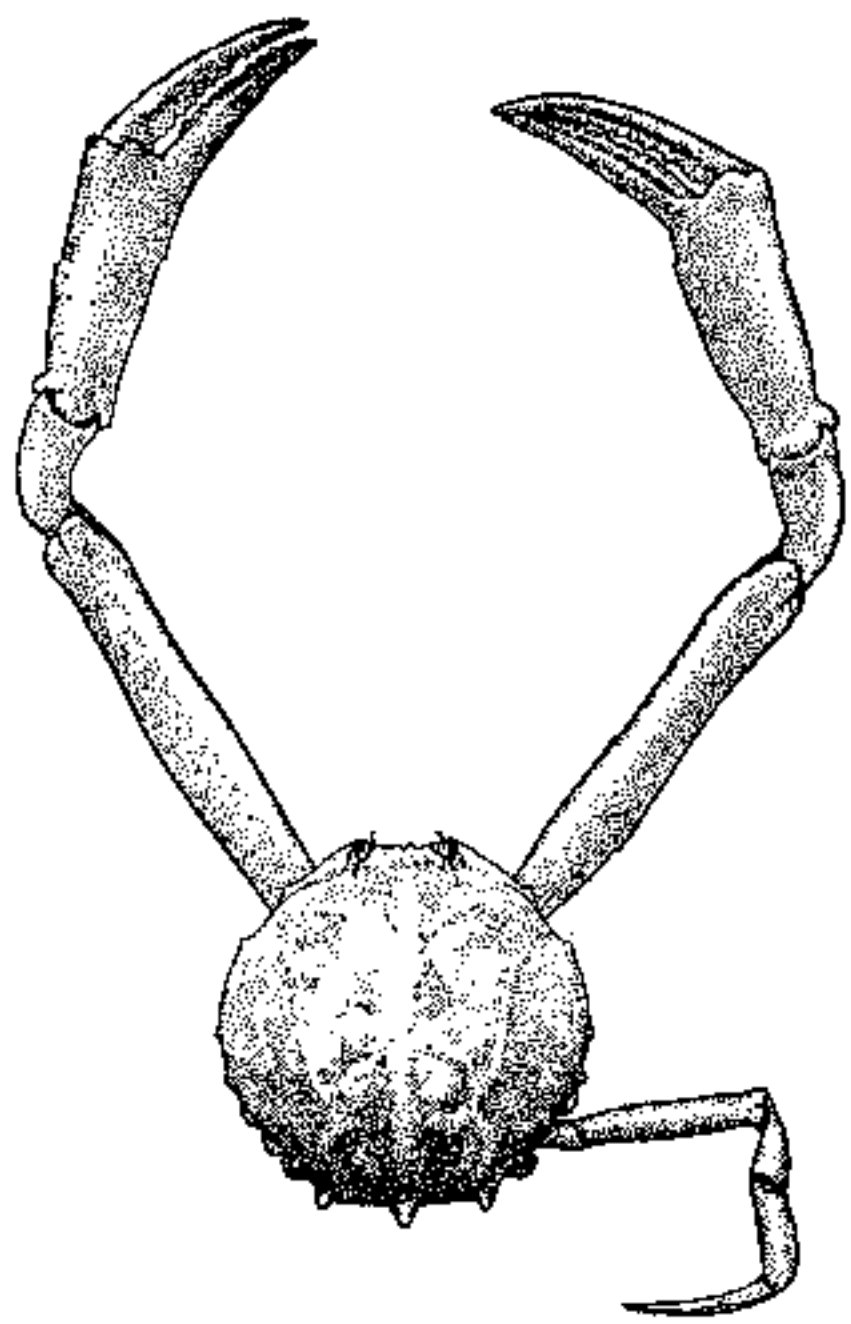


FIGURE 39.—*Randallia laevis*, male holotype: Carapace, 24 mm long. After Borradaile.

Description.—Carapace longer than broad, smooth, and minutely pitted except on the hinder edge, where it is granulate; with a marked median keel, indications of the regions, and a very shallow notch between hepatic and branchial regions. Front with a median notch between two slightly swollen projections; its edge fringed with hair, barely hiding mouth-frame. Fissures of orbit well marked. Of five spines in hinder region of carapace all somewhat upcurved, median and laterals fairly slender, intermediates little more than rectangular corners of hinder edge. Besides these, three blunt

spines on branchial and one on hepatic region. Exopodite of third maxilliped about as wide as endopodite, its outer edge gently curved. All legs quite smooth and unarmed. Chelipeds of male a little less than three times length of carapace; fingers finely but irregularly toothed, gaping a little at base, nearly as long as palm, which is about one-third as wide again as wrist. Walking legs short, slender, about one-fifth longer than arm of cheliped; dactylopodite equal to propodite with about half of carpopodite. (Borradaile.)

Measurement.—Male, length of carapace 24 mm.

Type locality.—Trinidad Island, off Brazil (latitude 20°30′ S., longitude 29°20′ W.). Only one specimen known, to all appearances picked up dead on shore.

RANDALLIA AGARICIAS Rathbun

FIGURE 40; PLATE 50, FIGURES 3, 4

Randallia agaricias RATHBUN, Proc. U. S. Nat. Mus., vol. 21, p. 614, pl. 44, fig. 7, 7a, 1898 (type locality, off Cape St. Lucas, 31 fathoms; holotype, U. S. N. M. no. 21601).

Diagnosis.—Carapace subcircular, covered with mushroom tubercles. A deep hollow either side of anterior carina. The lobes of middle pair of posterior protuberances nearly meet; those of outer pair minute.

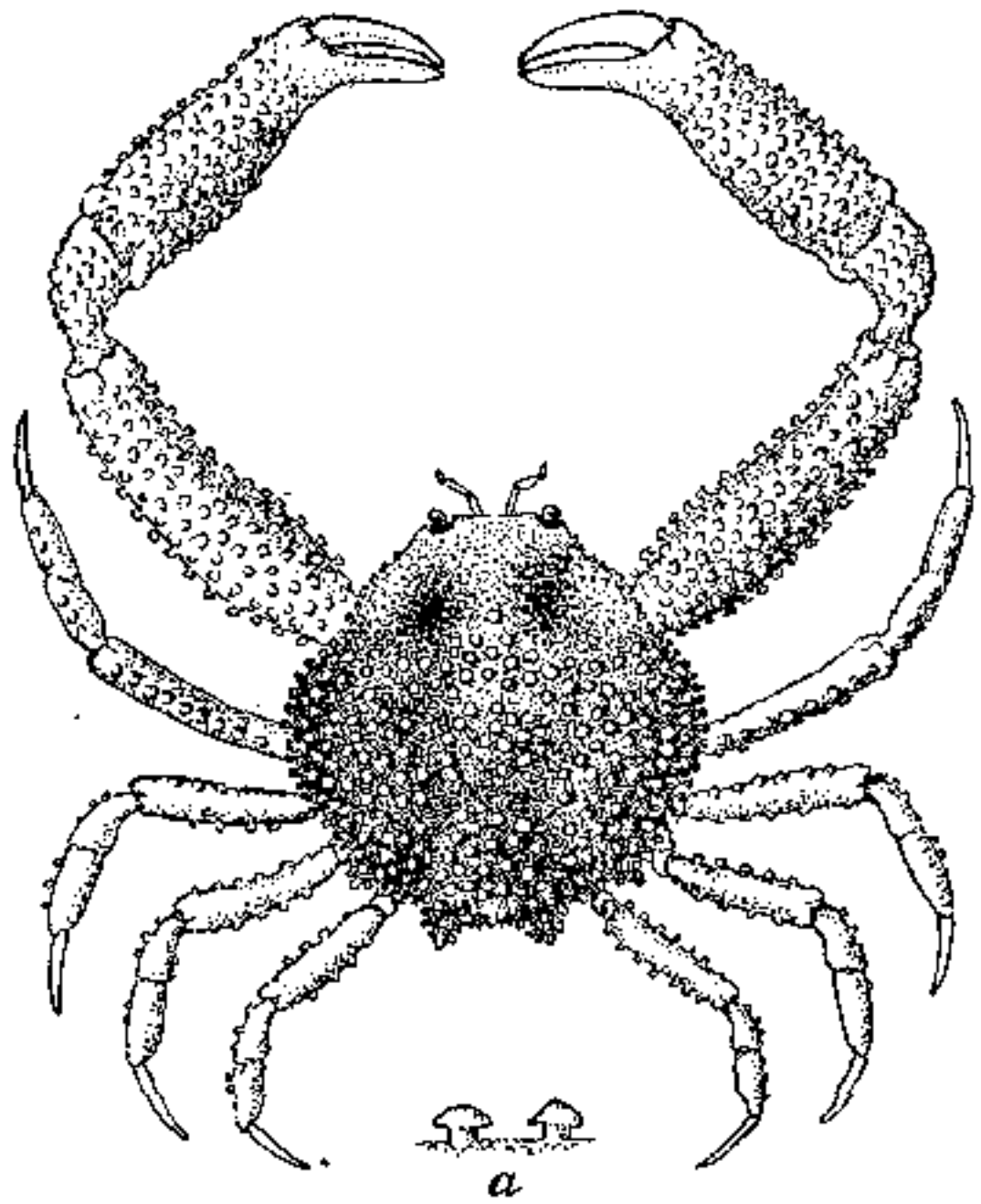


FIGURE 40.—*Randallia agaricias*, male holotype (21601), × 2; *a*, Side view of two tubercles enlarged.

Description.—Carapace slightly longer than broad. Posterior two-thirds convex and covered with large tubercles, which have

slightly convex surfaces and are mounted on short thickened stalks like mushrooms. On the anterior third a median ridge extends from the front across the gastric region; on either side is a hollow; surface covered with depressed granules. Hepatic region convex; pterygostomian region bluntly angular; neither is armed. Intestinal region distinctly outlined. Posterior margin with two broad rounded tuberculate lobes; posterolateral margin of branchial region with a smaller tuberculate lobe. Frontal margin with a blunt tooth at either end. Abdomen and sternum covered with beadlike tubercles; the maxillipeds with large irregular tubercles. The branchial channels are equally advanced with the orbital wall, margin entire. Chelipeds covered with tubercles similar to those of carapace; the largest ones on merus and outer surface of carpus and propodus. Length of merus about equal to width of carapace; dactylus less than two-thirds length of outer margin of propodus; latter rather narrow, width less than half exterior length. Legs granulate, with marginal rows of mushroom granules.

Measurements.—Largest male, median length 9.2, width 9 mm; larger female, median length 8.2, width 8.1 mm.

Range.—Mexico to Ecuador; 3 to 55 fathoms.

Material examined.—See table 56, page 181.

RANDALLIA MINUTA Rathbun

PLATE 84

Randallia minuta RATHBUN, Proc. Biol. Soc. Washington, vol. 48, p. 2, 1935.

Type locality.—Puerto Culebra, Costa Rica; dredging around isles in bay; February 25, 1934; station 257, *Velero III*, Hancock Galapagos Expedition; 1 male (U.S.N.M. no. 69745).

Diagnosis.—Size small. A smooth cap over the bidentate front. A raised flat plate on hepatic region. Four minute posterior prominences in male, absent in female.

Description.—Male: Carapace coarsely granulate except in the depressions between regions, and the front and hepatic region. These last are elevated and nearly smooth; the cap over the front has two teeth projecting forward and two backward, which are directly behind the front teeth. The hepatic region is covered by a round flat plate. Two small shallow lobes on posterior margin, and an equally small but more pointed lobe on posterolateral margin. Lower surface granulate. Merus of chelipeds coarsely granulate, carpus and manus finely so.

Ovigerous female: Posterior margin straight and adjacent margin slightly concave; neither has projecting lobes or teeth. Margin of posterior lobes of frontal cap more rounded than in male.

Measurements.—Male, length of carapace 4, width 4.2, length of manus 1.7, width 1 mm. Female, length of carapace 4.5, width 4.7 mm.

TABLE 55.—*Material examined of* Randallia bulligera

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″									
CALIFORNIA: Off San Diego			30					S. J. Holmes	?		Not examined by the writer.
MEXICO:											
Magdalena Bay, Lower California.	24 32 00	111 59 00	12	fne. gy. S		May 2, 1888	2831	*Albatross*	1♂ holotype 2♀	21600	
Do				S		Dec. 2, 1931		S. A. Glassell	1♀y	Glassell coll	
10mi. W. of mouth of Bayona River, Sinaloa.	22 38 00	105 55 00	12–17			July 29, 1932	T. 6. R.	*Zaca;* Crocker Exped.	2♂ 2♀ (1 with anemone.	Calif. Acad. Sci.	
15 mi. S. by W. of mouth of Bayona River, Boca Tecapan, Sinaloa.	22 34 00	105 53 00	10			July 28, 1932	T. 5. R.	do	3♂ 1♀	do	
Isabel Island	All around isle		10–25			Mar. 5, 1934	277	*Velero III*	7♂ 3♀ 3y	69313	Hancock Galapagos Exped.
Tangola-Tangola Bay, Santa Cruz.			15–20			Feb. 28, 1934	259	do	8♂ 10♀ 15y	69312	Do.
30 mi. S. of La Puerta	15 40 00	93 49 00	28			July 12, 1932	D. 9. R.	*Zaca;* Crocker Exped.	4♀	Calif. Acad. Sci.	
Tenacatita Bay, Jalisco.						Mar. 18, 1933	122	*Velero III*	1♂ 3♀	67996	Hancock Galapagos Exped.
Off Petatlan Bay	S. & W. of White Friars Ids.		25			Mar. 2, 1934	264	do	4y	69309	Do.
Acapulco						April, 1930		H. N. Lowe	1 ovig. ♀, 1 y. ♀	66509	
Do	Mouth of bay			Dredged		Apr. 5, 1932	2	*Zaca;* Crocker Exped.	1♀	Cal. Acad. Sci.	
COSTA RICA:											
Puerto Culebra, Cocos Bay.			2–4			May 13, 1933	116	*Velero III*	1♂ 3♀	67995	Hancock Galapagos Exped.
Do	In bay		10			Feb. 24, 1934	253	do	1♂ 1♀	69310	Do.
ECUADOR:											
Cape San Francisco			2	Mud, Rocks		Feb. 11, 1934	214	do	1♂	69748	Do.
	Latitude S.										
La Plata Island				Dredged		Jan. 22, 1933	23	do	1♂ 1♀	67998	Do.
La Libertad			2			Jan. 18, 1933	9	do	1♂ 2♀	67997	Do.
Do	N. of Point St. Elena		8–10			Feb. 9, 1934	209	do	1♂ 1 carapace	69311	Do.
PERU: Callao						1884		Sander	1♀	8550 Berlin Mus.	

TABLE 56.—*Material examined of* Randallia agaricias

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
MEXICO:					°F.						
Thurloe Bay, Lower California.	NW. of Thurloe Point.					Mar. 9, 1934	284	*Velero III*	1 ♂	69304	Hancock Galapagos Exped.
Magdalena Bay			15 18	S. 		Dec. 2, 1931 Dec. 3, 1931		S. A. Glassell	3 ♀ y.	Glassell coll.	
Off Cape St. Lucas	° ′ ″ 22 52 00	° ″ ″ 109 55 00	31	rky	74.1	May 1, 1888	2829	*Albatross*	3 ♂ 2 ♀	21601	1 ♂ is type.
Tres Marias Islands						*Feb. 1930*		*H. N. Lowe*	*1 ♂*		
Off Petatlan Bay, Guerrero.	N. end of White Friars Islands.		25	S.		Mar. 3, 1934	268	*Velero III*	1 ♀	69306	Hancock Galapagos Exped.
COSTA RICA:											
Puerto Culebra	In bay		10			Feb. 24, 1934	253	do	1 ♂	69296	Do.
Do	do		3-10			do	254	do	3 ♂ 5 ♀	69302	Do.
Do	Dredging around isles in bay.					Feb. 25, 1934	257	do	1 ♂ 1 ♀	69307	Do.
PANAMA:											
Secas Islands	S. of group		25	M. dead Sh		Feb. 22, 1934	250	do	5 ♂ 4 ♀	69305	Do.
Do	S. and W. of group		15	Nullipores		do	251	do	1 ♂	69747	Do.
Bahia Honda	Between Medidor and Pacora Island.		30-35			Feb. 21, 1934	244	do	1 ♀	69295	Do.
Do	Outside of isle S. of bay		15-20			Feb. 22, 1934	249	do	1 ♀	69300	Do.
COLOMBIA: Gorgona Island.	Near Gorgonilla Channel.		15	M.		Feb. 12, 1934	228	do	4 ♂ 3 ♀ (1 ovig).	69299	Do.
Do	N. end of isle		Shore			do	218	do	1 ♀	69325	Do.
ECUADOR:	*Latitude S.*										
Galapagos Islands: Albemarle Island.	Cartago Bay, ¼ mile from white rock.		33	M.		Jan. 25, 1934	186	do	1 ♂	69298	Do.
Do	Cartago Bay, SW. part of bay.		8-10			do	187	do	1 ♂	69303	Do.
La Plata Island	N. of anchorage		7-10	rky		Feb. 10, 1934	213	do	1 ♂ 5 ♀ 1 y	69308	Do.
Do			45-55	S. Shale R.		do	212	do	1 ♀	69297	Do.
La Libertad	N. of Point St. Elena		8-10			Feb. 9, 1934	209	do	6 ♂, 9 ♀, 6 y	69301	Do.

Range.—Costa Rica to Panama.

Material examined.—Besides the male type above, one female was taken at Secas Islands, Panama, in 15 fathoms, southwest of group; nullipores; February 22, 1934; station 251, *Velero III*, Hancock Galapagos Expedition (69746).

RANDALLIA CURACAOENSIS Rathbun

PLATE 51, FIGURES 1–3

Randallia curacaoensis RATHBUN, Proc. Biol. Soc. Washington, vol. 35, p. 101, 1922 (type locality, Curaçao; holotype in Amsterdam Museum); Bijdragen tot de Dierkunde, Amsterdam, vol. 23, p. 13, pl. 3, fig. 1–3, 1924.

Diagnosis.—No protuberances on posterior part of carapace. Front bilobed. Margin of efferent channel trilobed.

Description.—Female: Carapace subcircular, covered, except on the anterior and anterolateral portions, with large, unequal, close-set, pustulous granules; intestinal region well defined, cardiac region ill defined, gastric and hepatic regions not delimited. A granulated tubercle on the hepatic region. The tuberculate anterolateral margin terminates at the swollen and tuberculate pterygostomian protuberance. Intestinal margin arcuate, without lobes or spines. Front distinctly bilobed. Septum of branchial channel extending slightly beyond the orbit, the edge with three shallow lobes, the inner sinus shallow and arcuate, the outer one narrow and tapering to a point. Chelipeds covered with flat granulations, coarse on the merus, becoming gradually finer until near the fingers. Legs slender, subcylindrical, finely granulate. Abdomen and exposed part of sternum of female coarsely granulate.

Measurements.—Female holotype, length of carapace 8.4, width 7.5 mm.

Range.—Known only from the type locality, Spanish Water, Curaçao; April 3, 1920; C. J. van der Horst collector; 1 ovigerous female, holotype (Amsterdam Mus.), 1 immature female, paratype (56907).

RANDALLIA AMERICANA (Rathbun)

PLATE 52, FIGURES 1, 2

Ebalia americana RATHBUN, Proc. U. S. Nat. Mus., vol. 16, p. 254, 1893 (type locality, Gulf of California, 29 fathoms; holotype, U.S.N.M. no. 17388).
Randallia americana RATHBUN, Proc. U. S. Nat. Mus., vol. 21, p. 614, 1898.

Diagnosis.—Carapace longer than broad, covered with tubercles and granules. Front advanced, subtruncate. Hepatic and pterygostomian regions prominent. Five well-developed posterior protuberances.

Description.—Entire surface of carapace granular, the small granules crowded; on the posterior two-thirds large granules or tubercles predominate; they are acute, prominent, unequal. Cardiac and intestinal regions separated by deep grooves from the branchial region

and from each other; a large, pointed, granular tubercle on the median line of intestinal region. In the male the four posterior marginal protuberances are strong, the middle pair flattened, horizontal, blunt, the branchial pair more conical, acute and inclined upward; in the female the protuberances are shorter. A small cluster of large granules at summit of hepatic region and also on the pterygostomian prominence. A row of tubercles on anterolateral margin of branchial region. Rostrum upturned; carapace narrowed just behind orbits. The efferent branchial channel does not reach forward to the line of the orbital margin. Lower surface of body and also the merus of chelipeds covered with large depressed granules. Chelipeds of male about two and one-half, of female about one and one-half times the length of carapace; wrist and palm with small crowded granules; merus of legs more finely granulate; the fourth pair has a row of spiny granules below. Third, fourth, and fifth segments of male abdomen partially fused, the sutures persisting.

Measurements.—Holotype, male, median length of carapace 12.5; width 11; length of cheliped about 30 mm.

Range.—Gulf of California, Mexico; 9½ to 71 fathoms.

Material examined.—See table 57, page 184.

Subfamily LEUCOSIINAE [20] (restricted)

Iliinae ALCOCK, Journ. Asiatic Soc. Bengal, vol. 65, p. 166, 1896 (part).—IHLE, Die Decapoda Brachyura der *Siboga*-Expedition, monogr. 39b², p. 205, 1918 (part).

Merus of external maxillipeds less than half the length of the ischium measured along the inner border. Fingers slender, almost of the same diameter from base to near tip, either very much longer than the hand, or if shorter than the hand then of filiform slenderness; either opening and closing in a vertical plane, or if in a nearly horizontal plane then the tip of the dactylus is movable through an arc of about 120°; hands either short, swollen, and subglobular, or tapering-cylindrical with a swollen base, always much broader at the base than at the point of origin of the fingers.

Genus ILIACANTHA Stimpson

Iliacantha STIMPSON, Bull. Mus. Comp. Zool., vol. 2, p. 155, 1871 (type, *I. globosa* Stimpson).

Carapace globular, having three spines (one median) at posterior extremity of carapace. Anterior half of carapace unarmed or with one spine on either side. Chelipeds and legs very slender; palms twisted so that the fingers open in a vertical instead of a horizontal plane. The anterior extremities of the pterygostomian channels project beyond the orbits. Abdomen of male with segments 3–5 fused.

North Carolina to Bahia, Brazil; Lower California to Colombia.

[20] *Leucosia pacifica* Poeppig, Arch. für Naturg., vol. 2, pt. 1, p. 140, pl. 4, fig. 3, 1836, from Bay of Talcahuano, Chile, is a pinnotherid. See also footnote 17, p. 123.

TABLE 57.—*Material examined of* Randallia americana

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
MEXICO: Gulf of California:	° ′ ″	° ′ ″			°F.						
Angel de la Guarda Island, E. coast.			20		58	Jan. 8, 1932		S. A. Glassell	10 ♂1♀	Glassell coll.	
Angel de la Guarda Island, SE end.			20			do		do	1 ♂1♀y	do	
Angeles Bay			20	Sh. S.		Jan. 9, 1932		do	3 ♂3♀	do	
Tiburon Island, N. end			20			Jan. 1, 1932		do	1 ♂1♀y	do	
	28 28 00	112 04 30	29	gy. S.	62.9	Mar. 23, 1889	3014	*Albatross*	4 ♂	17388	Holotype and paratypes.
									1 ♂	4264, M. C. Z.	Paratype.
	28 07 00	111 39 45	71	fne. gy. S. brk. Sh.	57.9	do	3011	do	1 ♂	17387	
	27 45 00	110 45 00	20	gn. M.	65.2	Mar. 31, 1889	3037	do	1 ♂2♀	17389	
Carmen Island, Salinas Bay.			20			Dec. 19, 1931		S. A. Glassell	1y	Glassell coll.	
Do			20			Jan. 24, 1932		do	3♀	do	
	24 18 00	110 22 00	26½	brk. sh.		Apr. 30, 1888	2823	*Albatross*	5 ♂7♀	17627	
	24 16 00	110 22 00	21	gy. S. brk. Sh.		do	2822	do	1♂	17386	
	24 12 00 to 24 11 30	109 55 00	9½–10	Sh.		do	2826–2828	do	2 ♂1♀	22142	

KEY TO THE SPECIES OF THE GENUS ILIACANTHA

A¹. No spine on subhepatic margin.
  B¹. Fingers distinctly longer than palm.
    C¹. Spines of posterior margin subtriangular, blunt.... **subglobosa** (p. 185)
    C². Spines of posterior margin conical, acute.
      D¹. Median spine twice as long as lateral. Chelipeds 2½ times as long as carapace..... ***liodactylus*** *(p. 186)*
      D². Median spine one and one-half times as long as lateral. Chelipeds twice as long as carapace..... **hancocki** (p. 187)
  B². Fingers subequal to palm in length..... **intermedia** (p. 186)
A². A short, blunt spine on subhepatic margin.
  B¹. Posterior margin between lateral spines invisible in dorsal view. Carapace with many large granules..... **sparsa** (p. 190)
  B². Posterior margin between lateral spines visible in dorsal view. Carapace for the most part finely granulate..... **schmitti** (p. 192)

ANALOGOUS SPECIES ON OPPOSITE SIDES OF THE CONTINENT

ATLANTIC	PACIFIC
liodactylus.	*hancocki.*
sparsa.	*schmitti.*

ILIACANTHA SUBGLOBOSA Stimpson

PLATE 53, FIGURES 1, 2

Iliacantha subglobosa STIMPSON, Bull. Mus. Comp. Zool., vol. 2, p. 155, 1871 (type localities, 3 stations in the Florida reefs, 40–80 fathoms; types not extant).—RATHBUN, Bull. Lab. Nat. Hist. State Univ. Iowa, vol. 4, p. 291, 1898; vol. 9, p. 67, 1921.—HAY and SHORE, Bull. U. S. Bur. Fisheries, vol. 35 (1915–16), p. 424, pl. 32, fig. 2, 1918.

Diagnosis.—Carapace finely granulate. Fingers longer than palm.

Description.—Carapace subglobose, smoothly and evenly convex, and unarmed except at posterior extremity where there are three spines, the middle one highest, longest, and curved upward and the lateral ones flattened, subtriangular, blunt. Hepatic region considerably swollen but entirely unarmed; bounded posteriorly by a depression indicating the outer extremity of the cervical suture, which is entirely obsolete in its median portion. Intestinal region slightly protuberant above the base of the spine. Margin of carapace distinct and somewhat acute on the hepatic region and on the anterior part of the branchial, as far as a slight angular projection, posterior to which it ceases to be defined. Surface of carapace minutely granulate. Chelipeds two and a half times as long as carapace, excluding spine, and minutely granulate; merus more sharply granulate than carpus and hand; fingers very slender, much longer than the palm, and armed within with needlelike teeth. Ambulatory legs very slender and smooth, those of first pair reaching to middle of palm of the chelipeds; merus as long as the terminal three articles taken together; dactyli deeply grooved and with two fringes of hair

near together on upper and posterior surfaces. Male abdomen gradually tapering from fifth to seventh segment.

Measurements.—Male (55193), length of carapace to tip of spine 15.2, width 12.6 mm.

Range.—North Carolina to Barbados; 15 to 127 fathoms.

Material examined.—See table 58, page 188.

ILIACANTHA INTERMEDIA Miers

PLATE 54, FIGURES 1, 2

Iliacantha intermedia MIERS, Voyage of H. M. S. *Challenger*, Brachyura, vol. 17, p. 302, pl. 26, fig. 3, 1886 (type locality, Bahia; type in Brit. Mus.).—HAY and SHORE, Bull. U. S. Bur. Fisheries, vol. 35 (1915–16), p. 424, pl. 32, figs. 3, 3a, 1918.

Diagnosis.—Carapace coarsely granulate. Fingers much shorter than palm.

Description.—Similar to *I. subglobosa* but with more coarsely granulate carapace; posterior marginal spines short, flat, triangular, connected by a prominent line of granules. Intestinal region not protuberant above the spine. Indentations of distal end of pterygostomian channel wider and deeper than in *subglobosa*. Chelipeds slender; merus cylindrical and granulate, granules much coarser proximally; chela nearly as long as carapace, manus smooth, more or less club-shaped, somewhat inflated proximally but tapering rapidly to the very slender fingers which are about half the length of palm, incurved at tip and denticulate on their occludent margins. Male abdomen widening at sixth segment, which has convex sides.

Color.—Gray, without markings of any kind (Hay and Shore).

Measurements.—Female, St. Thomas (Copenhagen Mus.), length of carapace 26.6, width 21 mm.

Range.—North Carolina to Bahia, Brazil; 5½ to 20 fathoms.

Material examined.—See table 59, page 189.

ILIACANTHA LIODACTYLUS Rathbun

FIGURE 41; PLATE 55, FIGURES 1, 2

Iliacantha liodactylus RATHBUN, Bull. Lab. Nat. Hist. State Univ. Iowa, vol. 4, p. 291, pl. 8, fig. 2, 1898 (type locality, north of Trinidad, West Indies; type, immature male, U. S. N. M. no. 20327).

Diagnosis.—Three posterior acute spines; fingers as long as or a little longer than palm. Inner tooth of pterygostomian margin small, outer sinus large.

Description.—Carapace longer than wide, not counting spine; granules small, prominent and distant, intervening space minutely punctate. Lateral margin a definite line of crowded granules, hepatic

and branchial regions each bluntly angulate. Posterior spines conical, tips upturned, lateral pair two-thirds the length of median spine. Front not prominent, inclined slightly upward and divided into two blunt, finely granulated teeth, separated by a shallow sinus. Pterygostomian channel projects only slightly beyond orbital margin and does not exceed front; of the two notches, the outer is broad, deep and U-shaped, the inner very shallow. Chelipeds about two and a half times length of carapace; merus a little shorter than carapace, exclusive of posterior spine, slender, cylindrical, coarsely and rather densely granulate and with a blunt tooth at posterior proximal end; carpus and manus finely granulate; palm narrowing distally; fingers about one-fourth longer than palm, armed with about eight long, slender spines at intervals, the interspaces with from nine to twelve small irregular spines. Dactyli of legs smooth, with a thin fringe of hair on upper and lower margins.

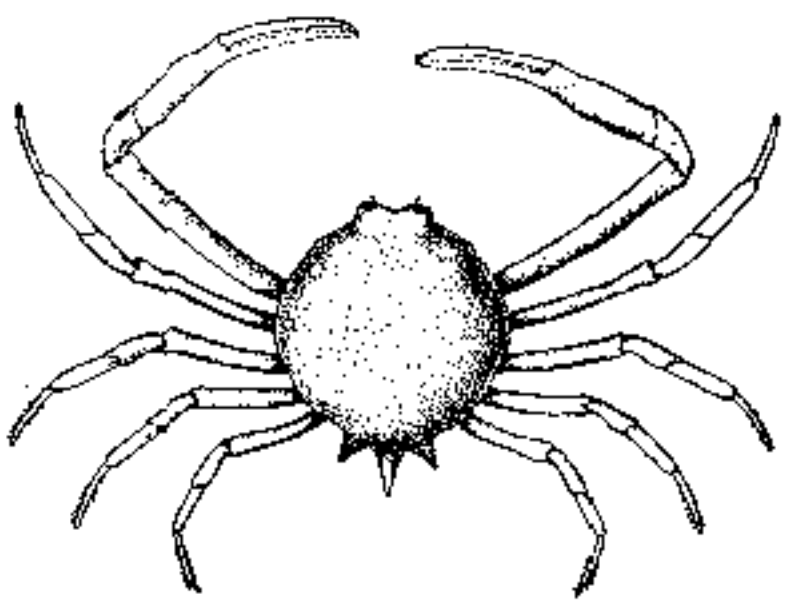


FIGURE 41.—*Iliacantha liodactylus*, male; Dorsal view.

Measurements.—Immature male, type, length of carapace to tip of median spine 17, length exclusive of spine 14.5, width 13.6 mm. Adult male (tip of spine broken off) length 28 mm, width 21.7, length of right palm 16, of movable finger 16.7, length of left palm 16.6, of movable finger 16 mm.

Range.—West coast of Florida to Trinidad, West Indies; 4¾ to 34 fathoms.

Material examined.—See table 60, p. 189.

ILIACANTHA HANCOCKI Rathbun

PLATE 57, FIGURES 1, 2

Iliacantha hancocki RATHBUN, Proc. Biol. Soc. Washington, vol. 48, p. 2, 1935.

Type locality.—Santa Maria Bay, Mexico; 35 to 40 fathoms; Hancock Galapagos Expedition; 1 male is type (U.S.N.M. no. 69260).

Diagnosis.—Allied to *I. liodactylus*. Differs in its shorter median spine, shorter and stouter chelipeds, terminal segment of male abdomen triangular.

TABLE 58.—*Material examined of* Iliacantha subglobosa

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
NORTH CAROLINA:	° ′ ″	° ′ ″			° F.						
Off Cape Hatteras	35 14 00	75 03 00	49	S. Co	71.4	Oct. 21, 1884	2302	*Albatross*	1 y	7258	
Do	35 11 30	75 05 00	59	crs. S. bk. Sp	75	do	2301	do	1 y	18460	
FLORIDA:											
Miami	Off Government cut		60			1914	138	J. B. Henderson	1 ♂ y	66518	
Straits of Florida	25 05 00	80 15 00	56	Co. S		Apr. 9, 1886	2640	*Albatross*	1 ♂	11380	
Off Sand Key			15			1893	41	State Univ. Iowa Bahama Exped.	1 y	S. U. I.	
Off Key West			60			1893	25	do	1 ♂ 2 ♀ y	S. U. I.	
Do			60			1893	26	do	1 ♂	22302	
SE. of Key West								J. B. Henderson	1 ♂	55219	
Gulf Stream, S. of Key West.				Co. fragments				do	2 ♀	55218	
Gulf Stream, S. of Sand Key Light.			60					do	1 ♂ 1 ♀ and frags	55193	
61 mi. S. by E. from Sand Key Light.								do	1 ♀ y	55196	
Tortugas	About 8 mi. S. of S. channel buoy.		18			July 22, 1924	44	W. L. Schmitt	1 ♀ y	66522	Gift of Carnegie Institution.
Do	About 9 mi. S. of no 2 red buoy.		30			June 11, 1925	220	do	1 ♀ y	66530	Do.
Do	S. of Loggerhead Key		40			Aug. 4, 1931		Longley and Manter.	1 ♀ ovig	71367	Do.
Off W. coast	26 13 00	83 44 00	51	wh. S	69	Mar. 18, 1889	5104	*Grampus*	1 ♀	15268	
CUBA: Off Habana			127			1877–78	65	*Blake*	1	6320, M. C. Z.	
JAMAICA: W. of	18 13 20	78 36 40	103	Co		1880	X	do	1 ♀	4459, M. C. Z.	
MONTSERRAT			88		69	1878–79	155	do	1 ♀	6668, M. C. Z.	
DOMINICA			118		65	do	177	do	2	2717, M. C. Z.	
BARBADOS:											
Off Barbados			76	crs. S. Sh. brd.	64¾	do	272	do	1 ♂	6321, M. C. Z.	
Do			94		61	do	276	do	1	2662, M. C. Z.	
Do			60	Co.	69	do	278	do	1	2764, M. C. Z.	
Do			56	Co. S. brk. Sh.	74½	do	292	do	1	6669, M. C. Z.	
W. by N. of Pelican Island, 2 mi.			75–90	S		1918	3	State Univ. Iowa Barbados-Antigua Exped.	1 ♀ y	S. U. I.	State University of Iowa.
1 mi. S. of St. Mathias Church.			60	crs. S		May 20, 1918	21	do	1 ♂	S. U. I.	Do.
W. by N. of Telegraph Station.	½ mi. or more offshore, about edge of drop off.		50–70	rky		June 1, 1918	66, 67	do	1 ♀ y 1 ♀ y	S. U. I. 58005	Do.

TABLE 59.—*Material examined of* Iliacantha intermedia

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
NORTH CAROLINA: Off	° ′ ″	° ′ ″			°C.						
Beaufort	Fishing grounds		14½	hrd		Aug. 11, 1914	8210	*Fish Hawk*	1♂1♀y 1♀y	51033 51039	
FLORIDA:											
Tortugas	SE. of SW. Channel buoy.		20			Aug. 16, 1924	9	*Dohrn*; W. L. Schmitt	1♂	66517	Gift of Carnegie Institution.
St. Martin Reef	28 26 30	83 08 00	10	sdy. Grs.	13.6	Jan. 15, 1902	7216	*Fish Hawk*	1♂	55195	
North Key	28 50 15	83 23 15	10	R. Co. Sh.	17 °F.	Nov. 28, 1901	7187	do	1♂	55190	
Off Cedar Keys	Light N. ¾ E., 21¾ mi.		5¾	Co	63.45 °C.	Jan. 11, 1913	7807	do	1♂	55197	
Pepperfish Key	29 08 15	83 42 00	10	S	19	Nov. 21, 1901	7163	do	1♀	55192	
Do	29 15 30	83 27 30	5½	sdy	16.2	do	7166	do	1♂	55189	
Pensacola								Silas Stearns	1♂	9374	In fish stomach.
ST. THOMAS									2♀	Copenhagen Mus.	
VENEZUELA: Cumana						Jan. 1857		Captain Couthouy	1♂1♀	698, M. C. Z.	

TABLE 60.—*Material examined of* Iliacantha liodactylus

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
WEST FLORIDA:	° ′ ″	° ′ ″			°F.						
Bell buoy off Sanibel Island Light, NE. 10 to 2½ miles.			4¾	Sh. wh. M		Jan. 1, 1913	7795	*Fish Hawk*	1 y	55202	
WEST INDIES:											
E. coast of Haiti	19 10 10	69 26 45	17	M		Feb. 16, 1933	54	Johnson-Smithsonian Exped.	1♂1♀	67816	
Mayaguez, Puerto Rico.						April 1934		V. Biaggi, Jr.	1♂	71374	Stuart T. Danforth, donor.
St. John, Virgin Islands.									1♀y	Copenhagen Mus.	
Off Trinidad	10 37 00 to 10 37 40	61 42 40 to 61 44 22	31–34	dk. slate-col. M.	67–73	Feb. 3, 1884	2121–2122	*Albatross*	1♂immature.	20327	Holotype.
Trinidad	Chacachacare Bay		20–25			Feb. 1878		Crosby	1♂1♀ immature.	66516	Gift of Boston Soc. Nat. Hist.

Description.—Male: Carapace with a narrow, produced front, giving the appearance of greater carapace length than width, exclusive of spine. Surface finely granulate, granules separated, those in the middle third depressed in pits. Posterior median spine about one and one-half times as long as lateral spines. Hepatic region with rudimentary tooth. Pterygostomian border rounded, not angular, farther back than in *liodactylus* and much less prominent. The last two segments of the abdomen have straight sides which steadily converge to a narrow, rounded point. Chelipeds twice as long as carapace and much less slender than in the allied species.

Color.—Reddish brown with a row of three light dots on either side of middle, forming an arch from the anterior corners of the cardiac region and continued diagonally forward along the cervical groove.

Measurements.—Type male, length of carapace without posterior spine 23.4, width 20.6 mm.

Range.—Lower California, Mexico, to Colombia; 10 to 40 fathoms.

Material examined.—See table 61, page 191.

ILIACANTHA SPARSA Stimpson

PLATE 56, FIGURES 1, 2

Iliacantha sparsa STIMPSON, Bull. Mus. Comp. Zool., vol. 2, p. 156, 1871 (type locality, West of Tortugas, 30 fathoms; type not extant).

Diagnosis.—A spine on subhepatic margin. Fingers and palm of subequal length. Carapace sparsely covered with coarse granules.

Description.—Carapace longer than broad; posterior margin unusually broad, its spines widely separated and divergent. All three posterior spines triangular, tips upturned, the median one somewhat longer. Dorsal surface sprinkled with large, upstanding granules on a base of smaller, depressed granules. A broad, prominent spine on hepatic region. Depression between frontal and gastric regions very deep, giving great prominence to the facial projection. Median sinus of front very deep, frontal teeth much projecting. Outer maxillipeds large and coarsely granulated. Remainder of lower surface paved with flat granules. Palms slender, gradually tapering; fingers and palm of subequal length.

Measurements.—Male (11020), length including spine 19.2, width 14.7 mm.

Range.—Gulf of Mexico to Barbados; 30 to 40 fathoms.

Material examined.—See table 62, p. 191.

TABLE 61.—*Material examined of* Iliacantha hancocki

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
MEXICO:											
Santa Maria Bay, Lower California.	1 mile W. of Hughes Point.		35–40			Mar. 7, 1934	281	*Velero III*	2 ♂ 2 y	69260	Hancock Galapagos Exped. Reddish brown color. 1 ♂ is holotype.
Petatlan	S. and W. of White Friars Islands.		25			Mar. 2, 1934	264	do	3 ♀ immature	69261	Hancock Galapagos Exped. Reddish brown color.
Tangola-Tangola	Tangola-Tangola Bay, Santa Cruz.		15–20			Feb. 28, 1934	259	do	1 ♂ 1 y	69263	Do.
COSTA RICA: Puerto Culebra.	In bay		10			Feb. 24, 1934	253	do	1 ♂ 1 immature ♀	69262	Do.
PANAMA: Bahia Honda	Between Medidor and Pacora Island.		30–35			Feb. 21, 1934	244	do	2 y. (imperfect)	69264	Do.
COLOMBIA: Port Utris	Near small island		20	M		Feb. 14, 1934	233	do	1 ♀ y	69265	Do.

TABLE 62.—*Material examined of* Iliacantha sparsa

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
	° ′ ″	° ′ ″			°F.						
GULF OF MEXICO						1885		*Albatross*	1 ♂	11020	From fish stomach.
NW. of Tortugas, Fla.	25 38 21	83 18 00	33	crs. gy. Gr. Sh. Co.	68.5	Mar. 1, 1889	5077	*Grampus*	1 ♂	15269	
PUERTO RICO:											
N. of	18 30 30	66 23 05	40	Co. Sponges		Feb. 7, 1933	26	Johnson - Smithsonian Exped.	1 ♂	67826	Swollen with parasite.
SE. of	18 31 00	66 10 15	38			Feb. 3, 1933	16	do	1 ♂	67824	
BARBADOS			30					*Hassler*	1 ♂	6437, M. C. Z.	

ILIACANTHA SCHMITTI Rathbun

FIGURE 42; PLATE 83, FIGURES 1, 2

Iliacantha schmitti RATHBUN, Proc. Biol. Soc. Washington, vol. 48, p. 2, 1935.

Type locality.—Gorgona Island, Colombia; 150 fathoms; Hancock Galapagos Expedition; 1 ovigerous female (69259).

Diagnosis.—Rostral teeth triangular, acute. Posterolateral spines thin, connected by a narrow margin visible from above.

Description.—Ovigerous female. Carapace nearly as broad as long to base of posterior spine and rostral spines. Surface covered with fine, close set granules, invisible to naked eye except at posterior end. Rostrum prominent, with two triangular, acute teeth, which are convex from side to side and from front to back, overreaching the eyes and deeply separated from each other by a triangular sinus. A deep groove above the pterygostomian channel. Anterolateral angle farther forward than in *hancocki* and tipped with a minute tooth or spine. Posterior margin of carapace beneath the median spine, transverse, visible from above, slightly convex in outline and with a large flat

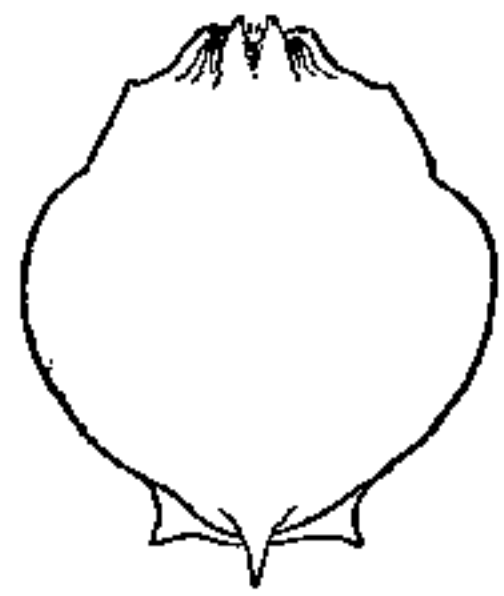


FIGURE 42.—*Iliacantha schmitti*, male: Outline of carapace, natural size.

triangular tooth at either end. Merus and ischium of outer maxillipeds with a fringe of hair along the lengthwise elevation. Palms not compressed. Fingers one and one-half times as long as upper margin of palm and armed with long, slender teeth interspersed with short ones. Dactyls of ambulatories with two rows of hair on upper surface.

Color.—In alcohol, mainly orange-yellow, rostral end red.

Measurements.—Length, measured between frontal teeth to base of posterior median spine, 31, width of carapace 28.8 mm.

Range.—Colombia; Ecuador; 10 to 150 fathoms.

Material examined.—See table 63, p. 195.

Genus CALLIDACTYLUS Stimpson

Callidactylus STIMPSON, Bull. Mus. Comp. Zool., vol. 2, p. 157, 1871 (type, *C. asper* Stimpson).

Carapace rounded, nearly as broad as long, regularly convex except near the anterior margins; hepatic region well defined, protuberant, and toothed; posterior half of carapace with seven spines. Front

short, basal article of antennules not indurated. Orbit longitudinal, with three very distinct fissures on the outer side, which extend to the base of the orbital tube. Pterygostomian channel strongly tridentate in front and extending beyond the orbit. Outer maxillipeds sharply granulated; exognath with a convex outer margin, little dilated; merus of endognath with a concave outer surface. Chelipeds of moderate length; chela much longer than merus; palm short, pyriform, much swollen within toward the base, and somewhat twisted, so that the fingers move in an oblique plane; fingers much longer than palm, very thin and delicate, laminate, curving upward and inward toward the tips, serrated on outer edge, armed within with numerous needle-shaped teeth. Ambulatory legs naked, except the dactyli which are sparsely pilose; propodus compressed, with a laminiform crest above and below; dactyli lanceolate, those of first three pairs 3-edged, those of posterior pair 2-edged and shorter and broader than the others.

In the female there is a deep, smooth channel on the outer maxillipeds, between and on the ischium joints, defined on either side by a strong ciliated ridge. This channel does not exist in the male and has doubtless something to do with the flow of water which bathes the eggs or young in the abdominal cavity. (After Stimpson.)

Contains only one species.

CALLIDACTYLUS ASPER Stimpson

PLATE 58, FIGURES 1–3

Callidactylus asper STIMPSON, Bull. Mus. Comp. Zool., vol. 2, p. 158, 1871 (type localities, three stations in Florida Keys, 16 to 37 fathoms; types not extant).

Diagnosis.—Carapace furnished with 11 or more spines. Exognath of outer maxilliped with convex margin. Fingers rough on both edges. Dactyli of first three pairs of legs 3-edged, of posterior pair 2-edged.

Description.—The sulci separating the gastric, cardiac, and intestinal from the branchial regions are easily traceable, as well as that between cardiac and gastric; but there is none between cardiac and intestinal regions. Hepatic region surrounded by rather profound depressions, and on its posterior part there is a strong toothlike protuberance occupying about one-third its area. Upper surface of carapace ornamented with scattered, prominent granules or short, capitate spinules which become less prominent posteriorly and disappear altogether near the posterior extremity, where the surface is covered with smaller and more crowded and depressed granules. On the lateral parts of the branchial region the two kinds of granules are found together. In the median line there are three or four short blunt spines on the posterior part of gastric and cardiac regions, the posterior one of which is rather remote from the others and much larger, nearly as large as the median posterior spine. A strong triangular tooth pointing forward, on subhepatic region, and a smaller

tooth at anterior extremity of branchial region on anterolateral margin. On posterolateral margin a small tooth or short spine. Three short posterior spines form a triangle. Outer maxilliped somewhat setose, the setae arising between the granules. The segments 4–6 of the female abdomen are soldered together; the surface is smooth and glossy about the middle, but there is a transverse tuberculated ridge on the fourth segment and the sixth is sparsely granulate. Segments 3–5 of male abdomen fused.[21]

Measurements.—Female type, length of carapace 17.9, breadth 15.5 mm.; male (55183), length of carapace 13.2, breadth 11 mm.

Range.—Coasts of Florida; 18 to 50 fathoms.

Material examined.—See table 64, page 195.

Genus LEUCOSIA Fabricius

Leucosia FABRICIUS, Supplementum entomologiae systematicae, p. 313, 1798 (type not mentioned).—LATREILLE, Considérations générales sur l'ordre naturel des animaux composant les classes des crustacés . . ., p. 422, 1810 (type *L. nucleus* Fabricius).

Ilia LEACH, Zoological miscellany, vol. 3, p. 19, 1817.—PESTA, Die Decapodenfauna der Adria, p. 292, 1918.

Carapace globular, having four spines on posterior half; very exceptionally the rudiment of a fifth spine may be noticed on the posterior half of the carapace. Frontal margin narrow, feebly produced with median indentation forming two blunt teeth. Upper wall of oval orbit open toward the front and bearing two fissures. Basis of second antenna filling the inner orbital fissure. Both pairs of antennae very small. Chelipeds greatly lengthened; palms much longer than wide, swollen at the base, then tapering distally and turning somewhat about the axis, so that the long thin fingers open in a vertical plane, merus cylindrical and elongate. The following legs much shorter than the chelipeds and decreasing in length consecutively. Sternal plate oval. Abdomen in both sexes 5-jointed; in the female the last segment abruptly narrowed and pushed up against the maxillipeds. (After Pesta.)

LEUCOSIA PLANATA (Fabricius) [22]

Cancer planatus FABRICIUS, Entomologia systematica, vol. 2, p. 446, 1793 (type locality, Tierra del Fuego; whereabouts of type unknown); Supplementum entomologiae systematicae, p. 350, 1798.—Bosc, Histoire naturelle des Crustacés, vol. 1, p. 238, 1802.—LATREILLE, Histoire naturelle . . . des Crustacés et des Insectes, vol. 6, p. 118, 1803.—LICHTENSTEIN, Ges. Naturf. Freunde Berlin Mag., vol. 7, p. 144, 1816.—MILNE EDWARDS, Histoire naturelle des Crustacés, vol. 2, p. 139, 1837.

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[21] Stimpson says that all the segments of the male abdomen except the terminal one are fused. His specimen was smaller than the male measured below.

[22] This species has never been described with enough detail to enable one to place it with certainty.

TABLE 63.—*Material examined of* Iliacantha schmitti

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
COLOMBIA:	° ′ ″	° ′ ″									
Cabita Bay (Cape Corrientes).	Near point		10			Feb. 13, 1934	231	*Velero III*	1 y	69330	Hancock Galapagos Exped.
Gorgona Island	N. end of isle.		20			Feb. 12, 1934	221	do	1 y	69331	Do.
Do	do		150			do	220	do	1 ♀ ovig	69259	Holotype.
ECUADOR: La Plata Island	*Latitude S.*		45–55	S. Shale R.		Feb. 10, 1934	212	do	1 fragment of large carapace, 1 y.	69332	

TABLE 64.—*Material examined of* Callidactylus asper

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
FLORIDA:	° ′ ″	° ′ ″			°F.						
Miami			30					J. B. Henderson	1 ♀	55194	
Off Key West	24 25 30	81 47 45	50		74	Jan. 15, 1885	2316	*Albatross*	1 ♀	17842	
Ship Channel, Key West								J. B. Henderson	1 ♂	55183	
Tortugas								do	1 ♂	55207	
Do	About 6 m. S. of S. Channel buoy.		18			July 22, 1924	44	W. L. Schmitt	1 ♀ soft shell 1 y	66520	Gift of Carnegie Institution.
Do	SE. of SW. Channel buoy.		20			Aug. 16, 1924	9	do	1 ♂	66521	Do.
Do	About 8 mi. S. of red buoy		25			June 11, 1925	217	do	1 y	66519	Do.
West of Cape Romano	25 44 32	83 21 15	34	fne. S	69	Mar. 11, 1889	5088	*Grampus*	1 y. ♀	15270	
					°C.						
Do	25 50 15	82 41 45	21	sdy	20	Apr. 2, 1901	7124	*Fish Hawk*	1 ♀	25602	
					°F.						
Do	26 08 00	83 22 00	33	S. blk. Sp	69.5	Mar. 18, 1889	5012	*Grampus*	1 ♂	15271	
HAITI: E. coast	18 30 10	66 13 50	50			Mar. 8, 1933	104	Johnson-Smithsonian Exped.	1 ♂	67817	

Description.—Minute. Carapace orbiculate, flat, margin smooth, slightly elevated. Rostrum with three small acute denticles. Sides bidentate, tooth at middle strong, markedly acute. Abdomen large, bent, orbiculate. Feet smooth, unguiculate. (Fabricius.)

Color.—Dark, feet ferruginous. (Fabricius.)

Range.—Known only from original specimen from Tierra del Fugeo.

Family CALAPPIDAE Dana

Calappidae and Matutidae DANA, United States Exploring Expedition, Crustacea, pt. 1, pp. 393, 394, 1852; pt. 2, p. 1427, 1853.

Calappidae ALCOCK, Journ. Asiatic Soc. Bengal, vol. 65, p. 137, 1896.

The afferent channels to branchiae open behind pterygostomian regions and in front of chelipeds. Antennae small. Outer maxillipeds not completely closing the buccal cavern and with the palpus not concealed by merus joint. Verges of male exserted from bases of fifth pair of legs.

KEY TO THE SUBFAMILIES AND AMERICAN GENERA OF THE FAMILY CALAPPIDAE

A¹. Last three joints of third maxillipeds not hidden by the meropodite. Orbits not separated from antennular sockets. **CALAPPINAE** (p. 197)

B¹. Carapace provided behind with a pair of lateral clypeiform expansions, under which the ambulatory legs may be concealed ..... **Calappa** (p. 197)

B². Carapace without lateral clypeiform expansions.

C¹. Carapace with a strong spine at middle of lateral margin. Outer maxillipeds do not meet across the mouth, thus exposing mandibles ..... **Mursia** (p. 215)

C². Carapace narrow, without spine at middle of lateral margin.

D¹. Merus of cheliped with a very long, outstanding spine. Stridulating ridges on inner surface of manus and suborbital region ..... **Acanthocarpus** (p. 220)

D². Merus of cheliped without long spine. Carapace subcircular, a small spine at lateral angle ..... **Cycloës** (p. 225)

A². Last three joints of third maxillipeds hidden by the meropodite. Orbits more or less separated from the antennular sockets. **MATUTINAE** (p. 234)

B¹. Carapace broad, suboval, convex, regularly arcuate in front. A well-marked depression below orbit ..... **Hepatus** (p. 234)

B². Carapace more or less angular, surface uneven. A very slight depression below orbit.

C¹. Carapace subrectangular, broader than long; lateral regions concave above ..... **Hepatella** (p. 247)

C². Carapace narrow, octagonal. Front rostrate ..... **Osachila** (p. 248)

Subfamily CALAPPINAE Alcock

Calappidae DANA, United States Exploring Expedition, Crustacea, pt. 1, p. 393, 1852; pt. 2, p. 1427, 1853.
Calappinae ALCOCK, Journ. Asiatic Soc. Bengal, vol. 65, p. 138, 1896.

Merus of external maxillipeds not elongate and acute (except in the exotic and somewhat aberrant genus *Orithyia*), and never concealing the palp in repose. Legs gressorial (except in the exotic genus *Orithyia*). (Alcock.)

Genus CALAPPA Weber

Calappa WEBER, Nomenclator entomologicus, p. 92, 1795 [type, *C. granulata* (Linnaeus)].
Camara DE HAAN, Fauna Japonica, Crustacea, pp. 67, 69, 1837 [type, *C. calappa* (Linnaeus)=*C. fornicola* DE Haan].
Lophos DE HAAN, Fauna Japonica, Crustacea, pp. 67, 69, 1837 [type *C. lophos* (Herbst)].
Gallus DE HAAN, Fauna Japonica, Crustacea, pp. 67, 70, 1837 [type, *C. gallus* (Herbst)].
Pistor GISTEL, Naturgeschichte des Thierreichs, p. ix, 1848; substituted for *Calappa*.

Carapace strongly convex, rounded in front, provided behind with a pair of lateral clypeiform expansions or wings, beneath which the ambulatory legs are concealed in flexion. Front small, somewhat triangular, projecting usually little or not at all beyond level of orbits, bilobed. Orbits small, circular; eyestalks short and thick. Antennulae nearly vertical. Basal article of antennae very broad and filling a wide hiatus at inner angle of orbit. Outer maxillipeds not meeting, but leaving exposed mandibles, and, in front of them, lamellar processes from first pair of maxillipeds. These processes form the bases of two channels separated by a deep vertical septum extending to antennulary fossae. Chelipeds very large, and in flexion fitting closely the front half of carapace, forming a sort of buckler. The merus has externally and near its distal end a transverse winglike expansion. Hand strongly compressed, its upper border forming a high dentate crest. Chelipeds equal except for the fingers, which on one hand have outside near the base a stout projecting lobule. Abdomen in adult with the third, fourth, and fifth segments fused.

Atlantic and Pacific coasts of America; Japan to Australia, Indian Ocean; western Europe and Africa.

KEY TO THE AMERICAN SPECIES OF THE GENUS CALAPPA

A¹. Carapace without a spine at either end of posterior margin, the extremities produced downward or inward on either side of first abdominal segment.
  B¹. No deep hollow between gastric and hepatic regions.
    C¹. Carapace widest behind middle. Proximal tooth of manus dentiform, its margin pointed or angled.
      D¹. Carapace broad, at least one and one-half times broader than long.
        E¹. Posterior third of carapace without short transverse granulated ridges.
          F¹. Posterior teeth of lateral wing obtuse, blunt; a concave longitudinal strip on lower half of manus..**flammea** (p. 198)
          F². Posterior teeth of lateral wing pointed; the smooth longitudinal strip on lower half of manus bent distally upward at an obtuse angle.....**springeri** (p. 205)
        E². Posterior third of carapace with short transverse granulated ridges. Surface covered with fine dots of color on a dark ground.....**convexa** (p. 206)
      D². Carapace narrow, not more than one and one-fourth times broader than long.
        E¹. Surface coarsely and nearly evenly granulate; tubercles high, subacute.....**saussurei** (p. 206)
        E². Surface finely granulate; tubercles low, rounded. **angusta**, adult (p. 210)
    C². Carapace widest in front of middle. Proximal tooth of manus lobiform, its margin arcuate, not pointed or angled.....**angusta**, young (p. 210)
  B². A deep hollow between gastric and hepatic regions. Posterior third of carapace covered with short transverse granulated lines.....**gallus** (p. 214)
A². Carapace with a prominent horizontal tooth at either end of posterior margin. A sharp spine at angle of posterolateral wing and another at proximal end of manus.....**sulcata** (p. 211)

ANALOGOUS SPECIES OF CALAPPA ON OPPOSITE SIDES OF THE CONTINENT

ATLANTIC	PACIFIC
flammea.	*convexa.*
angusta.	*saussurei.*

CALAPPA FLAMMEA (Herbst)

PLATE 59, FIGURES 1, 2; PLATE 60, FIGURE 1

Cancer chelis crassissimis CATESBY, The natural history of Carolina, Florida and the Bahama Islands, ed. 1, vol. 2, p. 36, pl. 36, lower figure, 1743; ed. 2, 1771.

Cancer granulatus LINNAEUS, Systema naturae, ed. 10, vol. 1, p. 627, 1758 (America: Mus. de Geer); Systema naturae, ed. 12, vol. 1, part 2, p. 1043, 1767 (part).[22]—GEO. EDWARDS, *in* Catesby, The natural history of Carolina, Florida and the Bahama Islands, ed. 2, vol. 2, p. 36, pl. 36, lower figure, 1771.

[22] In Systema Naturae, ed. 10, Linnaeus refers to Catesby's figure of the American *Calappa* (*flammea* or *marmorata* of authors) and says "Habitat in America. Mus. De Geer." In ed. 12, he says "Habitat in America. Mus. de Geer ex Algiria mihi." From this we infer that the locality "America" was taken from Catesby and that Linnaeus's type of *Cancer granulatus* was Mediterranean.

Cancer flammeus HERBST, Versuch einer Naturgeschichte der Krabben und Krebse, vol. 2, p. 161, pl. 40, fig. 2, 1794 (type locality, Ostindien; type not extant); vol. 3, pt. 3, p. 19, 1803 (America).

Calappa flammea BOSC, Histoire naturelle des Crustacés, vol. 1, p. 185, 1802.—MIERS, *Challenger*, Brachyura, vol. 17, p. 284, pl. 23, fig. 1, 1886.—RATHBUN, Bull. U. S. Fish Comm. for 1900, vol. 20, pt. 2, p. 84, pl. 2 (col.), 1901.—MONOD, Bull. Soc. Sci. Nat. Maroc, vol. 8, p. 117, figs. 5, 9B, 1928.

Calappa marmorata LATREILLE, *Histoire naturelle . . . Crustacés, vol. 5, p. 392,* 1803 (not *C. marmorata* Fabricius).

Diagnosis.—Extreme length of carapace about two-thirds extreme breadth; *posterior teeth of lateral wing obtuse, blunt; a concave longitudinal* strip on lower half of outer surface of manus.

Description.—Carapace, outer surface of winglike expansion of arm, upper surface of wrist, and outer surface of palm covered with coarse granules, more closely placed on anterior than on posterior half of carapace, and forming several longitudinal rows of flattened tubercles. Anterolateral border crenulate and granulate; posterior border, exclusive of wings, subentire with beaded edge. Wings well developed, with seven strong teeth with beaded edges, three behind and three in front of posterolateral tooth. Pterygostomian regions thickly covered with hair. Front with a large notch, projecting little beyond orbits. Endostomial septum extends forward in a strong tooth not reaching level of front. The winglike expansion at end of arm is conspicuously 4-lobed; the crest of palm is 8- or 9-toothed; its outer face has several large tubercles and a laminate inferior proximal spine.

Color.—Ground of carapace smoke-gray behind, shading to drabbish mottled with white, over greater part of carapace; color pattern Indian purple in interlacing bands on anterior half, obliquely longitudinal stripes on posterior half. Ground of exposed surface of chelipeds more of a heliotrope purple becoming almost white on lower half of palm and on fingers. Stripings of Indian purple on merus, carpus and upper part of proximal end of palm; two distant round spots of same color above middle of palm; spots and patches of sulphur yellow on teeth and tubercles of upper half. This same yellow is mixed with the background of merus and carpus and slightly so with that of carapace. Two or three cadmium orange spots near base of dactylus, a few spots near articulation of palm and wrist. A dragon's blood red covers greater part of inner surface of cheliped, the pterygostomian regions, the anterior surface of first ambulatory leg and a small part of second leg. Remainder of ambulatory legs, lower face of arm, also abdomen and sternum whitish. (R. L. Barney.)

Measurements.—Female, extreme length of carapace 80, width at sinus just in front of wings 105, greatest width of carapace 118 mm.

Range.—Southeastern Massachusetts to Brazil; Bermuda; Cape of Good Hope (Miers); perhaps Indian Ocean. Surface to 40 fathoms; 125 exceptional.

Material examined.—See table 65, pages 200–204.

TABLE 65.—*Material examined of* Calappa flammea

Location	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
MASSACHUSETTS:											
Falmouth								Student of J. H. Gerould.	1 ♀ y	39443	
Woods Hole	Great Harbor							V. N. Edwards	1 y	14321	U. S. Fish Commission.
Do	Eel pond					1905		Woods Hole Station.	1	Woods Hole Station.	
Woods Hole Harbor.	Ram Island		Low water						1	Boston Soc. Nat. Hist.	
Naushon Island						Apr. 3, 1861		W. H. Forbes	2 y	6400, M. C. Z.	
Do	Off Gay Head		5	S		Sept. 3, 1884		U. S. Fish Commission.	4 y	38234	
South of Nantucket.			Surface			Aug. 5, 1884	2195	*Albatross*	25+	38240	Megalops.
RHODE ISLAND: Newport.									Young	W. Faxon	
	° ′ ″	° ′ ″									
NEW JERSEY: E. of	39 38 50	70 22 29	Surface			July 16, 1886		*Albatross*	4 Megalops	11843	
NORTH CAROLINA:											
Off Cape Hatteras.	35 21 10	75 22 40	14			Oct. 19, 1884	2282	do	1 ♀	7226	
Do	35 21 25	75 24 25	13			do	2285	do	1 ♂	7235	
Beaufort						Nov. 1919		R. L. Barney	1 ♂	54162	
Do						June, 1863		A. S. Bickmore	2 ♀	6401, M. C. Z.	
Do								U. S. Bureau of Fisheries.	1 ♂	66415	
Beaufort Harbor.								Wm. Stimpson	1 ♂	2023	
Morehead City				Sand flat		Apr. 7, 1891		*Fish Hawk*	1 ♂ 1 ♀	17169	
Southport						May 25, 1897		H. H. Brimley	1 large		
SOUTH CAROLINA: Charleston Harbor.						Apr. 1, 1880		R. E. Earll	1 ♀	4036	
FLORIDA:					°C.						
Hawk Channel	½ mi. SE. by S. of SE. end of Duck Key.		2¼	rky	24.5	Jan. 27, 1903	7429	*Fish Hawk*	1 ♂	68522	
Indian Key			Low tide	Along shore				H. Hemphill	1	14940	
Boca Ceiga Bay	Inner shore of Pine Key.					Jan. 1884		do	1	6444	
Key West			2 feet below extreme low tide.					do	2	8959	Shedding shell.
Do			Between tides	Sand flat		1885		do	2	13826	

Do					1923		Williams Galapagos Exped.	1 ♂	N. Y. Zool. Soc.	
Do							C. N. E. Eliot	1 y	22993	
Do	Near station				Mar. 1, 1920		U. S. Bureau of Fisheries.	2 ♀ (1 soft shell)	66440	
Do							do	2 ♂ 4 ♀	66442	
Do	Little Salt Pond Key				Nov. 7, 1922		do	1 ♂ 2 ♀ 1 juv.	71062	
Do							*J. E. Mills*	1	*713, M. C. Z.*	
Pourtales Plateau	10 mi. S. of Key West	125	rky. Co				J. B. Henderson	1 y	68532	
Off Key West	Key West Lt. to E. channel bar buoy, 71°53′, to Beacon A, 74°46′.	5¼			Feb. 13, 1902	7278	*Fish Hawk*	2 ♀ y	68516	
Do	5 mi. off breakwater, NW. Passage to Key West	6½					*J. B. Henderson*	1 ♀ y	*68500*	
Boca Grande Pass					Mar. 4, 1889		*Fish Hawk*	1	20103	
Tortugas					Apr. 15, 1858		J. E. Mills	1 ♂ 1 ♀	669, M. C. Z.	
Do					Mar. 27, 1860		T. Lyman	1 y	6403, M. C. Z.	
Do		4					J. B. Henderson	1 y	68533	
Tortugas, White Shoals.	5 mi. S. of Loggerhead Key.	7–10			July 20, 1924	29–32	W. L. Schmitt	1 y	*66356*	*Gift of Carnegie Institution.*
Tortugas	4–5 mi. S. of No. 2 buoy.	About 40			July 22, 1924	38	do	1 y	66357	Do.
Do	Cross channel haul E. of Loggerhead Key, *from* S 1 to N 2 buoy.	10			June 11, 1925	211	do	1 y	66355	Do.
Do	W. side of Loggerhead Key.	Beach			Aug. 1, 1930		W. Longley, Jr.	1 carapace	71368	*Do.*
Do		9½			June 26, 1931	12	do	1 carapace	67752	Do.
Do					1931		do	1 ♀	66354	Do.
Do					July–Aug. 1930		W. Longley, Jr.	1 ♂	69316	
Do					1928		A. S. Pearse	1 ♀	62152	Do.
Do					1893		State Univ. Iowa Bahama Exped.		S. U. I.	
Do					1934		H. H. Darby	1 ♂	71061	
Bird Key reef					Aug. 5, 1924		W. L. Schmitt	1	63117 Buffalo Mus.	Do.
S. end of Bird Key			On sand near dock.		Aug. 13, 1924		do	1 ♀	66353	Do.
Fort Jefferson					Apr. 22, 1861		J. B. Holder	1 ♂	6402, M. C. Z.	
Fort Jefferson moat.					Aug. 4, 1924		W. L. Schmitt	1 ♀	66365	Do.
Do	Walking on weeds, E. *at entrance, about 5* p. m.				Aug. 16, 1924		Earl Sands	1 ♀	66363	Do.
Do					July, 1930		Dexter Thompson	1 ♂ 1 ♀ Soft shell	66366	Do.
Do					Aug. 1930		do	1 ♂	69317	Do.
3 mi. N. of Loggerhead Key.		*Feet* 10–45	On shoals		June 17, 1925		Taylor and Thompson.	1 y	66380	Do.

TABLE 65.—*Material examined of* Calappa flammea—Continued

Location	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
FLORIDA—Continued.	° ′ ″	° ′ ″									
W. side of Loggerhead Key.	Below lighthouse dock.							A. S. Pearse	1 ♂	65090	Do.
N. of Tortugas	3½ mi. W. of station 5052.		*Fathoms* 24	Brought up on a hand line.		Feb. 15, 1889		*Grampus*	1	15265	
SE. of SW. Channel buoy.			20	Boat dredge		Aug. 16, 1924	9	*Dohrn*	2 y	66362	Do.
Bell buoy off Sanibel Island Light.	NE. 10–2½ miles		4¾			Jan. 1, 1913	9	*Fish Hawk*	1 ♀	50982	
Captive Key, Charlotte Harbor.						1859		G. Wurdemann	2 ♂ 1 ♀	705, M. C. Z.	
Anclote section	28 08 00	82 53 30	3	sdy. brk. Sh	13	Jan. 23, 1902	7228	*Fish Hawk*	1 ♀ y	68523	
Do	28 19 45	83 06 30	8½	rky, G	13	Jan. 24, 1902	7240	do	1 ♀	68517	
North Key section	28 47 45	83 28 00	11½	R. Sh	17	Nov. 28, 1901	7186	do	1 y	68521	
Pepperfish Key section.	29 26 15	83 37 30	6¾	S	17.3	Nov. 20, 1901	7156	do	1 ♀ y	68519	
Aucilla section	29 39 00	84 07 00	8½	R. Co. Sh	18	Dec. 5, 1901	7194	do	1 y	68518	
Near Cedar Keys.						Feb. 1887		*Bache*, Lieut. J. F. Moser.	1	12473	
Spring Creek, Wakulla County.						1931		R. P. Gwaltney	1 ♂		
Pensacola						1883		Silas Stearns	1 ♂ 2 ♀	5233	From fish stomachs.
Florida Keys								J. B. Henderson	1	45966	
Florida								G. Wurdemann	2 ♂	1363, M. C. Z.	From Smithsonian Institution.
Do								Boston Aquarial Gardens.	1 ♂, soft shell	1044, M. C. Z.	
TEXAS:											
Corpus Christi						1929		Mrs. Mary E. Quisenberry.	1	63030	
Kingsville								Clyde T. Reed	1 ♂	71069	Texas College of Arts and Industries.
GULF OF MEXICO						Winter, 1885		*Albatross*	1	9311	
Do								John McKinster Roe.	1	49131	
MEXICO: Off Progresso, Yucatan.			6–7					E. H. Thompson	1 ♂	M. C. Z.	

COSTA RICA: Coliblanco									1 ♀	Field Mus.	
CUBA:											
Cayo Punta, Tolete.			2–3			May 25, 1914	355	Henderson & Bartsch.	1 y	48537	*Tomas Barrera* Exped.
Habana						July, 1863		F. Poey	1 ♂	6405, M. C. Z.	
Cienfuegos						Sept. 1859		Joseph Aviles	1 ♂ 1 ♀	723, M. C. Z.	
BAHAMAS:											
Green Turtle Cay								E. A. Andrews	1 y	20716	
The Current, Eleuthera Island.						July 5, 1903		B. A. Bean	3 y	31083	Geogr. Soc., Baltimore.
Off Ambergris Key.			3	grassy		July 19	8	*Blake*	1 ♀ y	M. C. Z.	
JAMAICA:											
Montego Bay			Shallow water.	Caught in fish-pots.				C. B. Wilson	3 ♂	42915	
Do			do	In seine		June 24, 1910		do	1 ♀	42891	"Trunk crab."
Black River								C. R. Orcutt	1 ♂ 1 chela	66371	
Port Royal								P. W. Jarvis		Inst. of Jamaica	
Bull Bay								C. R. Orcutt	1 ♂	66373	
Do						Mar. 6, 1928		do	1 ♂ 1 ♀	66370	
Cow Bay								Mrs. R. E. Cooke	1 ♂	66372	C. R. Orcutt donor.
Jamaica								C. R. Orcutt	2 ♀	66369	
Do						Mar. 1–11, 1884		*Albatross*	1 ♀	7676	
HAITI: Torbeck								C. R. Orcutt	1 ♂ 1 chela	66375	
SAN DOMINGO: Puerto Plata.								Charles A. Fraser	1 ♂	4156	
PUERTO RICO:											
Mayaguez				Boat dredge		Jan. 19, 1899		*Fish Hawk*	1 y	24075	
Do				Coral reef		Jan. 20, 1899		do	1 ♂	24069	
Mayaguez Harbor						do		do	1 y	24077	
Boqueron Bay						Jan. 25, 1899		do	1 ♂	24070	
Arroyo						Feb. 17, 1899		do	1 ♂	24071	
Fajardo						do		do	1 y	24076	
San Juan Harbor						do		do	1 ♂ 1 ♀	24073	
Catafio, San Juan Harbor.						Jan. 13, 1899		do	1 ♀	24072	
Tallaboa								New York Acad. Sci.	1	Amer. Mus.	
Salinas Cove								do	1	do	
CULEBRA: Ensenada Honda.						Feb. 10, 1899		*Fish Hawk*	1 ♀ y	24074	
ST. THOMAS:											
St. Thomas Harbor.								C. R. Shoemaker	1 ♂ 1 ♀	50509	Gift of Carnegie Institution.
St. Thomas								Copenhagen Mus.			
ST. CROIX								Harry A. Beatty	1 ♀	69323	
ST. MARTIN: Bay of Philipsburg.						Aug., 1905		Dr. Shaw	2 ♂ medium.	Leiden Mus.	
SABA BANK			21			1878–79	144	*Blake*	1 ♂ 1 ♀	4462, M. C. Z.	
ST. JOHN								Copenhagen Mus			
DOMINICA: Roseau			5–15					A. H. Verrill	1 ♀	32511	

TABLE 65.—*Material examined of* Calappa flammea—Continued

Location	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
	° ′ ″	° ′ ″									
BONAIRE:											
Lagoon			Shallow			June 7, 1905		J. Boeke	1 ♂ large	42947	From Leiden Museum.
Klein-Bonaire			Beach	Corals		June 5, 1905		do	1 ♂ large	Leiden Mus	
Lac (entrance)						1930		P. Hummelinck	1 ♂		Returned to sender.
CURAÇAO:											
Pescadores Bay			Very shallow water.	Between the stones.		July 21, 1905		J. Bocko	1 ♀ sm	Leiden Mus	
Caracas Bay			Dredge			Oct. 7, 1908		do	1 ♀ very lge	do	
Rifwater (lagoon)			½ fathoms	Small beam trawl.		Oct. 21, 1905		do	1 ♂ sm	do	
ARUBA: Boca San Nicolas.						July 31, 1905		do	1 ♂ lge	do	
OLD PROVIDENCE						Apr. 4-9, 1884		*Albatross*	1 ♂	7545	
PANAMA:											
Fox Bay, Colon						Mar. 31, 1911		Meek & Hildebrand.	1 ♂ 1 ♂ 1 ♀	Field Mus 43998	Smithsonian Biol. Survey
Toro Point, Canal Zone.						Jan. 26, 1912		do	1 ♂	59276	Do.
COLOMBIA:											
Sabanilla						Mar. 16-22, 1884.		*Albatross*	1 ♂	7567	
Puerto Colombia							23	Brother Elias	1 ♀	71113	
VENEZUELA:											
Porlamar, Margarita Island.						July 7, 1895		Lieut. Wirt Robinson, U. S. A.	1 ♂	18817	Common.
BERMUDA:											
Hungry Bay						July–Sept		F. G. Gosling	3 y	25449	
Castle Harbor						June 29, 1932		H. G. Richards	1 y	69448	
Bermuda								F. V. Hamlin	2 y	4021	
Do						Recd. Aug., 1862.		A. S. Bickmore	1 ♂	6404, M. C. Z	
Do						Aug. 7, 1903		Bermuda Biological Station.	1 y	7605, M. C. Z	
BRAZIL:	*Latitude S.*				°*F.*						
Off Cape St. Roque.	6 59 30	34 47 00	20	brk. Sh	79	1887	2758	*Albatross*	2 dactyls	18622	
Maria Farinha, Pernambuco.						1875–1877		R. Rathbun	1 ♂	40575	Hartt Exploration.

CALAPPA SPRINGERI Rathbun

PLATE 60, FIGURE 1; PLATE 61, FIGURES 1, 2

Calappa springeri RATHBUN, Proc. Biol. Soc. Washington, vol. 44, p. 71, 1931, (type locality, Pass à Loutre, La.; type, U. S. N. M. no. 64073).

Diagnosis.—Allied to *C. flammea* but carapace longer and narrower. Posterior teeth of lateral wing pointed. The smooth longitudinal strip on lower half of manus bent distally upward at an obtuse angle.

Description.—Front shallow, median sinus obtuse-angled; orbital margin flat, not prominent nor deeply interrupted. Anterolateral denticles 13, shallow but definitely outlined; behind them are five (not four) larger teeth, narrower at base and less produced sideways than in *flammea*. Middle portion of posterior margin produced, forming a clearly marked angle at either end; of the two large teeth beyond, the outermost has a sharp tip. The granulation of upper surface and of margins finer, lower and less conspicuous than in *flammea*. The smooth area on lower half of palm is narrow proximally, gradually widening and is continued obliquely upward. The proximal tooth of upper margin is truncate, not bifid; remaining teeth flatter and wider than in *flammea*. Dactylus of ambulatories widest at about the proximal fourth. Segment 4 of male abdomen has sides nearly parallel, segment 6 is nearly as wide at distal end as at proximal, terminal segment abruptly narrowed at middle to tip. Terminal segment in female larger than in *flammea*, sides sinuous; sixth segment relatively shorter than in *flammea*, sides concave.

Color.—General back area light buff-pink or vinaceous-pink tending to salmon; granules lighter. Hinder parts more whitish. Frontal border dotted and shaded a light or drab Indian purple. Five small spots behind front and three subparallel to anterolateral margin washed-out brown or hazel. Ring in center of carapace same color. Tips of five large lateral teeth white. Chelae almost iridescent between granules; granules dull; superior teeth with Indian purple spots. Inside of carpus and merus dragons blood red; purple spots on merus at sinuses between teeth. (W. L. Schmitt.)

Measurements.—Male, length 93.5, width 143 mm. Female, type, length 85, width 123 mm.

Range.—Gulf of Mexico.

Material examined.—As follows:

Louisiana: Off Pass à Loutre; about 12 fathoms; 1931; Stewart Springer collector, Caribbean Biological Laboratories; 1 female holotype (64073).

Florida: About 10 miles south of Tortugas; 49 fathoms; station 31; July 2, 1932; W. L. Schmitt collector, Carnegie Institution; 1 male (66383).

CALAPPA CONVEXA Saussure

PLATE 62, FIGURES 1–3

Calappa convexa SAUSSURE, Rev. Mag. Zool., ser. 2, vol. 5, p. 362 [9], pl. 13, fig. 3, 1853 (type locality, Mazatlan, Mexico; type not located).—BOONE, Zoologica, vol. 8, p. 280, fig. 281, 1927.

Calappa xantusiana STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 7, p. 237 [109], 1860 (type locality, Cape St. Lucas; type not extant).

Diagnosis.—Posterior third of carapace with short transverse granulated ridges. Surface covered with fine dots of color on a dark ground.

Description.—Length of carapace two-thirds to three-fourths of breadth. Allied to *C. flammea* in its little protruded front and in the character of the surface. It is, however, more convex than that species, and the triangular teeth of the posterolateral margins are more strongly carinated along the middle above; also there are numerous short transverse crenulated carinae on the posterior third of the carapace; elsewhere the surface is depresso-papillose and crowdedly granulated. The frontal sinuated margin and teeth are obtuse and there is no median denticle. Hands much higher than greatest length; superior crests 6-toothed, teeth less acute than in *C. flammea;* granules smallest near upper border, increasing in size and decreasing in numbers toward lower margin; two horizontal rows of tubercles on lower third meet at proximal end and are continued upward at proximal end almost at a right angle, the tubercles increasing in size.

Color.—A dried specimen has the carapace dull red with fine dots of pale yellow; granulated ridges also yellow. On the carpus and distal end of merus of chelipeds the yellow spots are larger; on the upper half of the manus the ground is red with irregular splotches of yellow, on the lower half the ground is yellow with little red. Carpus and propodus of legs red with large white spots; on the merus the white predominates. Fingers for the most part a dull leaden gray in the major chela, gray only at finger tips of minor chela.

Measurements.—Male (59275), extreme length 83, extreme width 115, width at sinus in front of lateral wings 103.4 mm. Male, Los Angeles Mus., length 85.2, width 129 mm. Female (50652), extreme length 98.2, extreme width 142.4, width at sinus in front of lateral wings 114.5 mm.

Range.—Magdalena Bay, Mexico, to Ecuador; shore to 10 fathoms.

Material examined.—See table 66, p. 208.

CALAPPA SAUSSUREI Rathbun

FIGURE 43, PLATE 63, FIGURES 1–4

Calappa saussurei RATHBUN, Proc. U. S. Nat. Mus., vol. 21, p. 609, pl. 41, fig. 6, 1898 (type locality, Gulf of California, 26½ fathoms; type, U.S.N.M. no. 21596).—FINNEGAN, Journ. Linn. Soc. London, Zool., vol. 37, p. 611, fig. 1, 1931.

iagnosis.—Carapace narrow, widest at the antepenult tooth of lateral margin; tubercles prominent.

Description.—Carapace slightly broader than long, almost circular exclusive of the posterolateral limb, which has a subrectangular outline. Two well marked grooves form the lateral boundaries of cardiac and gastric regions. Tubercles of carapace conical, disposed as follows: Gastric region with two large median and two smaller lateral in advance of these, and about 18 very small tubercles; cardiac with one central larger surrounded by six smaller; branchial region with about 15 large and more than that number of small; intestinal region with six in two lines diverging posteriorly; hepatic region with five or

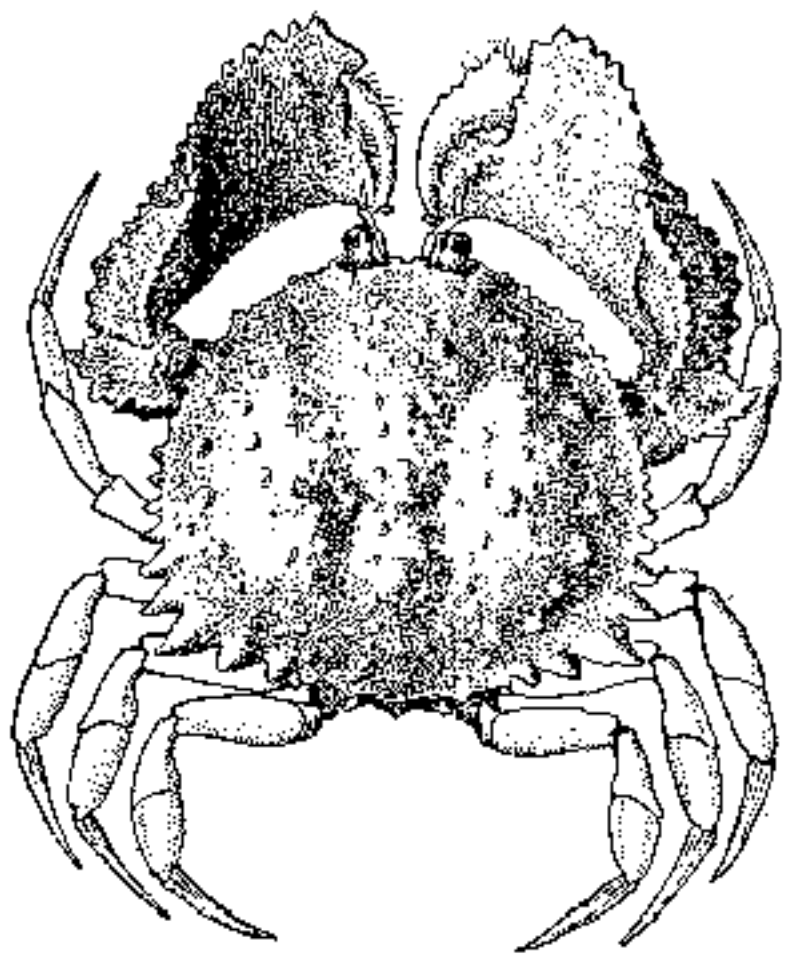

FIGURE 43.—*Calappa saussurei*, male holotype: Dorsal view, 20.5 mm long.

six very small depressed tubercles. Surface of tubercles densely granulate; surface between them covered with isolated granules. Margins of front slightly rimmed. The lateral border has five or six denticles on hepatic region, about six larger ones on branchial region; branchial expansion with five lateral teeth increasing successively in size, the third and fourth most produced outwardly, and three posterior teeth diminishing in size toward median line; posterior margin with a shallow tooth at each end.

Chelipeds with many large tubercles, irregular in size and disposition and the intervening space covered but not crowded with granules; tooth at proximal end of manus triangular; outer tooth of merus bifid; fingers coarsely granulate.

Measurements.—Male, holotype, length 20.5, width at middle 23.6, greatest width 24.4, width at posterolateral angles 22.9 mm.

Range.—Gulf of California, Mexico, to Ecuador; 7 to 150 fathoms.

Material examined.—See table 67, page 209.

TABLE 66.—*Material examined of* Calappa convexa

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″									
MEXICO:											
Magdalena Bay	Belchers Point					Dec. 2, 1931		S. A. Glassell	1	Glassell Coll.	Dead on beach.
Do						Mar. 1917		C. R. Orcutt	1 ♀	50652	Very large.
La Paz Bay						Dec. 26, 1919		A. L. Herrera	1 ♂ lge		Returned to sender.
Punta Peñascosa, Sonora.						Feb. 1934		H. N. Lowe	1 ♀	69401	
Tres Marias Islands.	Isla Madre						A1864	do	1 ♀	Los Angeles Mus.	
Tenacatita Bay, Jalisco.			2–3			Mar. 18, 1933	122	*Velero III*	1 carapace, y	68016	Hancock Galapagos Exped.
Petatlan Bay	Between bay and White Friars Islands.		6–10			Mar. 3, 1934	269	do	2 y	69234	Do.
Acapulco								A. Agassiz	2 ♀	907, M. C. Z.	
Do								do	1 ♂	1024, M. C. Z.	
Do								*Hassler*	1 ♂	6397, M. C. Z.	
COSTA RICA:											
Puerto Culebra	Shore along S. slough					Mar. 12, 1933	115	W. Chas. Swett	1 major chela	67861	Do.
Do	In bay		10			Feb. 24, 1934	253	*Velero III*	1 y	69231	Do.
Do	do		3–10			do	254	do	2 y	69232	Do.
Do	Dredging around isles in bay.					Feb. 25, 1934	257	do	1 y fragments	69233	Do.
Punta Arenas						Jan. 1907		P. Biolley	1 ♀	39103	From J. Fid Tristan.
Golfo Dulce						Feb. 1923		M. Valerio	1 ♀	61035	
PANAMA:											
Chame Point								Robert Tweedie	1 ♀	50495	
Taboga Island						May 11–15, 1911		Meek & Hildebrand	1 ♂ 1 ♀ 1 y, 1 cast shell	43997	Smithsonian Biol. Survey.
Taboguilla Island						June 1914		J. Zetek	1 ♂	48770	
Do			Shore			Oct. 28, 1904		*Albatross*	1 ♂	33396	
Panama Market						Feb. 7, 1912		Meek & Hildebrand	1 ♂	59275	Smithsonian Biol. Survey.
Do						Apr. 1, 1912		do	1 ♂	47906	Do.
Panama								Capt. J. M. Dow	1 ♂ 1 ♀	3263	
Do						1860		A. Agassiz	3 ♂	1046, M. C. Z.	
Do						1863		Dr. Sternbergh	1 ♂	6398, M. C. Z.	
Do						1885		do	1 ♂	6399, M. C. Z.	
COLOMBIA: Cabita Bay (Cape Corrientes).	Dredging N.W. of point		10	M		Feb. 13, 1934	230	*Velero III*	Fragment of manus.	69414	Hancock Galapagos Exped.

ECUADOR:										
Cape San Francisco.	Dredging near rocks	2	M. R.		Feb. 11, 1934	214	do	2 y	69413	Do.
	Latitude S.									
La Plata Island	N. of anchorage	7-10	R		Feb. 10, 1934	213	do	1 y	69233	Do.
Salinas		Beach			Sept. 15, 1926		W. L. Schmitt	1 y	66510	Walter Rathbone Bacon Scholarship.
Galapagos Islands	Eden Island off Indefatigable Island.				1923		Williams Galapagos Exped.	1 ♂	57727	
Do	*Seymour Island, Velero Bay.*	*5*			*Jan. 22, 1934*	*173*	*Velero III*	*1 y*	*69758*	*Hancock Galapagos Exped.*

TABLE 67.—*Material examined of* Calappa saussurei

Locality	Bearings		Fathoms	Bottom	Temperature,	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
	° ′ ″	° ′ ″			°F.						
MEXICO:											
Off San Josef Island.	24 51 00	110 39 00	40	S. brk. Sh	72	Mar. 16, 1889	2998	*Albatross*	1 y	17466	
La Paz Bay	24 18 00	110 22 00	26½	brk. Sh		Apr. 30, 1888	2823	do	1 ♂, holotype	21506	
Off San José del Cabo.	23 00 00 to 23 06 00	109 36 00 to 109 31 00	14			Aug. 4, 1932	D. 18. R.	*Zaca*, Crocker Exped.	1 ♂ y., 1 ♀ y.	Cal. Acad. Sci.	
Do			25			Aug. 5, 1932	D. 19. R.	do	2 ♂ y	Cal. Acad. Sci.	
Off S. end of	14 52 00	93 04 00	35			July 11, 1932	D. 8. R.	do	1 ♂ 1 ♀	Cal. Acad. Sci.	
PANAMA: Bahia Honda.	Between Medidor & Pacora Island.		30-35			Feb. 21, 1934	244	*Velero III*	1 ♂ & 2 chelae	69227	Hancock Galapagos Exped.
COLOMBIA:											
Puerto Utria			15-20	S., Sea-urchins		Feb. 14, 1934	235	do	1 y	69229	Do.
Do	Opposite passage		20			Feb. 15, 1934	238	do	1 y	69757	Do.
Gorgona Island	N. end of isle		150			Feb. 12, 1934	220	do	1 ♂	69226	Do.
Do	do		20			do	221	do	1 y	69267	Do.
ECUADOR:	*Latitude S.*										
La Plata Island.			45-55	S., Shale, R		Feb. 10, 1934	212	do	1 ♂ 1 ♀	69228	Do.
Do	N. of anchorage		7-10	R		do	213	do	1 y	69230	Do.
Chatham Island, Galapagos.	*E. of Wreck Bay*		*32*			Jan. 21, 1934	170	do	1 y	69334	Do.

CALAPPA ANGUSTA A. Milne Edwards

PLATE 64, FIGURES 1–6

Calappa angusta A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, no. 1, p. 18, 1880 (type locality, Barbados, 100 fathoms, *teste* Bouvier, 1902; type in M. C. Z., no. 6653).—A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 27, no. 1, p. 123, pl. 24, figs. 5–8; pl. 25, figs. 1–3, 1902.—HAY and SHORE, Bull. U. S. Bur. Fisheries, vol. 35 (1915–16), p. 421 (not pl. 31, fig. 7, 1918, a young *flammea*).

Calappa saussurei tortugae RATHBUN, Proc. Biol. Soc. Washington, vol. 46, p. 183, 1933 (type locality, Tortugas; type, U. S. N. M. no. 66382).

The word "*angusta*" is suited to the young of this species for which it was named by A. Milne Edwards, the posterior part being narrower than the middle. The adults, however, are of good size and are widest behind, as in other American species.

Diagnosis.—Compared to *C. saussurei*, the adult carapace is wider across the middle. Tubercles low, arcuate, not acute; less prominent in posterior portion of carapace. Posterolateral wings less elevated. Tubercles less prominent on manus and smaller on lower half.

Description.—Anterolateral margins finely granulate, with slightly larger granules at intervals. Front seen from above bilobed, each lobe with a sinuous margin which is also the margin of the antennular cavity. Inner superior border of orbit much swollen. Both margins of lateral expansion slightly concave; tooth at posterolateral angle much the largest, followed anteriorly by four small teeth gradually diminishing in size and posteriorly by one small and one or two minute teeth; tooth at either end of posterior margin obtuse-angled, raised, and thickened. Surface covered with protuberances, granulate between the tubercles. Orbit completely separated from antennular cavity. Manus with coarse granules interspersed with tubercles which form three irregular oblique rows, subparallel to proximal end of palm, and a row of five close to the superior row of eight marginal teeth. Abdomen with sixth segment subquadrate, terminal segment subtriangular, slightly longer than wide, tip blunt in the full grown.

Color (66381).—General ground color buff to buff-yellow; high spots or lumps on carapace brick red, on chelipeds blood red. Marginal spines of carapace, crest of chela and lumps on crest ground color. Hairs of carapace, especially those of hind margin, a sort of light olive-yellow; those of ambulatory legs light citrous yellow. Merus of chelipeds practically colorless. Under parts whitish, pterygostomian region and maxillipeds suffused with pale rose purple. (W. L. Schmitt.)

Measurements.—Male (51070), length of carapace 16.7, greatest width 18.7, width at posterior angles 17 mm. Male (66382), length

33.9, width at middle 39.8, greatest width 42.2, width at posterolateral angles 39.4 mm.

Range.—From North Carolina to Grenada; 7½ to 115 fathoms.

Material examined.—See table 68, page 212.

CALAPPA SULCATA Rathbun

PLATE 64, FIGURES 7, 8; PLATE 65, FIGURE 1

Calappa sulcata RATHBUN, Bull. Lab. Nat. Hist. State Univ. Iowa, vol. 4, p. 289, pl. 9, figs. 3, 4, 1898 [*type locality, off Delta of the Mississippi, 35 fathoms* (14941)]; Bull. U. S. Fish Comm. for 1900, vol. 20, pt. 2, p. 85, 1901.

Diagnosis.—Carapace with a prominent horizontal tooth at either end of posterior margin. A sharp spine at angle of posterolateral wing and another at proximal end of manus.

Description.—Extreme width of carapace little greater than extreme length. Upper surface of carapace finely granulate; five prominent longitudinal rows of tubercles; anterolateral border with about 14 crenulations, granulate on edge. Posterior margin with a large triangular prominent tooth at either end. Posterolateral wings subrectangular, a large spine at angle, in front of which are three teeth diminishing in size; on the posterior edge are two larger subequal teeth, the inner one a little the smaller. Front divided by a round median notch into two teeth; a much smaller tooth at inner end of orbit. The endostomial septum has a short sharp tooth pointing forward and visible in front view.

Arm expansion 4-lobed, outer lobe much the largest, prolonged to a spine. Superior crest of palm with six or seven teeth; outer surface with a broad, nearly smooth, horizontal sulcus which distally turns at an obtuse angle and terminates opposite the upper line of dactylus; it is bordered for the most part by coarsely granulate tubercules.

Color.—In alcohol, light pinkish brown. Seven small and narrow rings of dark red: three on carapace, one median encircling the third median tubercle, counting from the front; one on each branchial region, about middle of length of carapace and encircling the fourth of the outermost continuous row of tubercles. One ring on each wrist and one on each palm near upper margin and inclosing the tubercle toward proximal end of margin; this tubercle is not in the center of the ring but near its upper periphery.

Measurements.—Female (24079), extreme length 21, width at posterior lateral spines 23.8, width at sinus in front of wings 23 mm.

Range.—North Carolina to Gulf of Mexico and Puerto Rico; 12 to 35 fathoms.

Material examined.—See table 69, page 213.

TABLE 68.—*Material examined of* Calappa angusta

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″									
NORTH CAROLINA:					C.						
Off Cape Lookout	Cape Lookout Lighthouse, E. by N. ⅛ N. 1¾ mi.		7½	brd. S	27	July 24, 1902	7302	*Fish Hawk*	1 ♂	68530	
Off Beaufort	In Gulf Stream		47			Sept. 3, 1914	2849	do	1 ♂	51070	
FLORIDA:											
Miami			30					J. B. Henderson	1 ♂	68505	
Off Miami	In Gulf Stream		75			1915		do	1 y	68534	
Fowey Rocks	1 mi. E. ¼ N. of Fowey Rocks Light.		50	fne. gy. S. Co.	20.5	Mar. 30, 1903	7516	*Fish Hawk*	8 ♂ 10 ♀ (4 ovig.)	68515	
SE. of Fowey Rocks.			55			1916		J. B. Henderson	1 cholipeed	66464	
					F.						
Off Carysfort	25 11 30	80 10 00	60	Co. S	69.2	Apr. 9, 1886	2641	*Albatross*	1 ♂	11398	
Off Sand Key	SE. by E. ½ E. of Sand Key.		90					J. B. Henderson	1 ♂ 1 ♀	68507	
Do	S. by E. of Sand Key Light.		61					do	1 ♂ 1 ♀ ly	68508	
Sambo Key			110					do	1 ♀	68506	
Straits of Florida	25 05 00	80 15 00	56	Co. S		Apr. 9, 1886	2640	*Albatross*	1 ♀	11406	
Do	25 04 50	80 15 10	56	do	56	do	2639	do	1 ♀	11388	
Off Sombrero			54			April, 1871		Wm. Stimpson	1 ♂	6664, M. C. Z.	
Off Key West	Sand Key Light bearing WNW., Key West Light bearing N.		60			June 19, 1893	24	State Univ. Iowa Bahama Exped.	2 ♂	S. U. I.	
Do	do		60			do	26	do	1 ♂	20028	
Do	Sand Key Light W. by N., Key West Light NW., by N.		Abt. 80			June 26, 1893	47	do	1 ♀	S. U. I.	
S. of Key West			90					J. B. Henderson	1 ♂	68509	
									2 ♂ 5 ♀	66382	Gift of Carnegie Institution. Variety with flatter tubercles.
Tortugas	S. of no. 2 red buoy		60			July 22, 1931		W. L. Schmitt	1 ♀	66381	Color note. Gift of Carnegie Institution. Variety with flatter tubercles.

Sand Key SE. by E			75					J. B. Henderson	1 y	66462	
West coast of Florida.	25 34 00	83 28 00	39	Gr. Co. fne. Sh.	69	Mar. 1, 1889	5076	*Grampus*	1 ♂	15266	
South of Loggerhead Key.	No. 2 red buoy		40			Aug. 4, 1931		Longley and Manter.	1 ♂	71369	Gift of Carnegie Institution.
Do	do		40			do		do	1 ♀	71371	Do.
South of Tortugas			35–40			Summer, 1933		Capt. John W. Mills.	1 ♀	71370	
MEXICO:											
North of Yucatan	23 32 00	88 05 00	95			1877–78	32	*Blake*	1 ♂	M. C. Z.	
Do	23 13 00	89 16 00	84		60	do	36	do	1 ♂	2917, M. C. Z.	
WEST INDIES:											
St. Thomas									2	Copenhagen Mus.	
Santa Cruz			115	R. brk. Sh	65	1878–79	132	*Blake*	1 ♂	M. C. Z.	
Barbados			103	Co. brk. Sh. yl.	59.5	do	273	do	1 ♂	2702, M. C. Z.	
Do			100			Dec. 1871		*Hassler*	1 ♂	6653, M. C. Z.	Type.
Do	Lazaretto E. by N. ½ N., Pelican Island S. E.			fne. S		June 7, 1918	88	State Univ. Iowa Barbados-Antigua Exped.	1 y	S. U. I.	
Grenada			92	do	62	1878–79	262	*Blake*			
Do			159		53.5	do	263	do	Part of 1 carapace.	2918, M. C. Z.	

TABLE 69.—*Material examined of* Calappa sulcata

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″									
NORTH CAROLINA:											
Off Cape Hatteras	35 35 20	74 58 45	27	crs. gy. S		Oct. 20, 1884	2296	*Albatross*	1 ♀	8817	
Do	35 20 50	75 19 50	16	gy. S. brk. Sh		Oct. 19, 1884	2277	do	1 y.	17571	
ALABAMA: S. of Mobile Bay	29 24 30	88 01 00	35	yl. S. bk. Sp		Mar. 4, 1885	2388	do	1 ♀	14941	Type.
PUERTO RICO:											
Mayaguez Harbor	Black buoy, entrance harbor, N. by W. ½ W., ½ mile.		12–18	S. M		Jan. 20, 1899	133 (6061)	*Fish Hawk*	1 ♀	24079	

CALAPPA GALLUS (Herbst)

YELLOW BOX CRAB

PLATE 65, FIGURES 2, 3

Cancer gallus HERBST, Versuch einer Naturgeschichte der Krabben und Krebse, vol. 3, pt. 3, pp. 18 and 46, pl. 58, fig. 1, 1803 (type locality, East Indies; type not extant).

Cancer (Calappa) gallus LATREILLE, *in* Cuvier, Règne animal, ed. 2, vol. 3, p. 24, 1817.

Calappa gallus MILNE EDWARDS, Histoire naturelle des Crustacés, vol. 2, p. 105, 1837.—RATHBUN, Bull. U. S. Fish Comm., vol. 20 (1900), pt. 2, p. 85 1901.—MONOD, Bull. Soc. Sci. Nat. Maroc, vol. 8, p. 116, figs. 2B, 3, 9D, 1928.

Calappa galloides STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 7, p. 71 [25], 1859 (type locality, Florida Keys; type not extant).

Calappa squamosa DESBONNE, *in* Desbonne and Schramm, Crustacés de la Guadeloupe, etc., p. 51, pl. 6, 1867.

Calappa gallus var. *bicornis* MIERS, Crustacea, *in* Report on the zoological collections made in the Indo-Pacific Ocean during the voyage of H. M. S. *Alert*, p. 550, 1884 (type locality, Providence Island, 19 fathoms; type in Brit. Mus.).

Calappa gallus var. *galloides* A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 27, no. 1, p. 122, 1902.

Calappa gallus var. *capellonis* LAURIE, Brachyura, *in* Herdman's Reports to the Government of Ceylon on the Pearl Oyster Fisheries of the Gulf of Manaar, Suppl. Repts. no. 40, p. 354, 1906.

Diagnosis.—A deep hollow between gastric and hepatic regions. Between the hollows two transverse rows of four tubercles each, the outer tubercles of the hind row much the largest. Posterior third of carapace covered with short transverse granulated rugae.

Description.—Extreme length of carapace varying from about three-fourths to five-sixths of breadth; anterior two-thirds covered with tubercles, posterior one-third with short, transverse, granulate ridges; anterolateral margin crenulate; posterior border slightly arcuate, finely beaded, unarmed; clypeiform expansions well developed, bearing six strong teeth with beaded edge, two teeth behind and three in front of posterolateral tooth. Orbits directed forward, only slightly upward. Rostrum wholly in advance of orbits, laminate, and with four subequal, blunt teeth. Hepatic region defined by furrows; a large median tubercle in front of cervical suture. Upper surface of wrist tuberculate. Winglike expansion near end of arm 4-toothed. About 10 tubercles on upper half of outer surface of palm; on the lower half the tubercles widen into crenulate laminae; on and near the fixed finger are small, round, flat tubercles.

Color.—Upper parts generally orange to orange-brown, becoming brighter on front of chelae; under parts dull yellow. Carapace above and front of chelae covered with irregular spots of dark red or reddish brown, variable in size and form; many of the larger granules and tubercles of carapace white, especially those that lie in rows on the posterior transverse ridges and those on the scattered elevations.

Fingers smoky horn-color, becoming blackish on upper side of dactyl. Ambulatory legs yellow, finely reticulated with red lines. (A. E. Verrill.)

Variation.—The carapace varies in relative length and breadth due to greater or less convexity; in size and prominence of dorsal tubercles; and in distinctness of rostral teeth, some having four teeth, others having no median sinus, or the lateral teeth slightly developed. The variations do not correspond with geographical regions.

Measurements.—Male (66368, Bird Key Reef), extreme length of carapace 49, width at sinus just in front of wings 51.2, greatest width of carapace 64 mm.

Range.—Florida Keys to Bahia, Brazil; Bermuda; west Africa; Red Sea and Persian Gulf; islands of Indian and Pacific Oceans; beach to 120 fathoms.

Material examined.—See table 70, page 216.

Genus MURSIA Leach

Mursia Leach, *in* Desmarest, Dict. Sci. Nat., vol. 28, p. 231, 1823 (type not mentioned).—Desmarest, Considérations générales sur la classe de Crustacés, *p. 108 (footnote), pl. 9, fig. 3, 1825 (type "Mursie Mains-en-crête").*—Latreille, *in* Cuvier, Règne animal, ed. 2, vol. 4, p. 39, 1829 (type not mentioned).—Milne Edwards, *in* Cuvier, Règne animal (Disciples' ed.), pl. 13, fig. 1, 1837 (type *Mursia* [*Mursica*, by error] *cristata*).

Platymera Milne Edwards, Histoire naturelle des Crustacés, vol. 2, p. 107, 1837 (type *P. gaudichaudii* Milne Edwards).

Thealia Lucas, Ann. Soc. Ent. France, vol. 8, p. 577, 1839 (type, *T. acanthophora* Lucas).

Carapace oval, moderately convex, rounded in front, rapidly contracted behind, the evenly arched anterolateral margins ending in a large lateral epibranchial spine. Front with a small acuminate tip. Orbits large, oval, with a distinct fissure in upper margin and with two deep gaps in lower margin in one of which rests the basal article of the antenna. Eyes large, eyestalks short and thick. Antennules fold obliquely; basal article of antennae not dilated. No distinct epistome; endostome prolonged into a canal incompletely divided longitudinally; first pair of maxillipeds have each a lamellar process to complete the canal below. The external maxillipeds do not meet across the mouth but expose the mandibles. Chelipeds enlarged much as in *Calappa* but merus with merely a distal ridge with one or more spines instead of a transverse crest. Palm with a dentate crest less high than in *Calappa*. Chelipeds asymmetrical as regards fingers, which on one hand have at base of prehensile edge a stout lobule. Legs large, first two pairs at least as long as chelipeds. Male abdomen with segments 3–5 fused; in both sexes the tergum of first segment is entirely concealed and that of second strongly carinate transversely. (After Alcock.)

West coast of America to Japan and Australia.

TABLE 70.—*Material examined of* Calappa gallus

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
FLORIDA:	° ′ ″	° ′ ″			° C.						
Hawk Channel	½ mi. SE. by S. of SE. end of Duck Key		2¼	rky	24.5	Jan. 27, 1903	7429	*Fish Hawk*	1 ♂	68514	
Lower Metacumbe Key.			Below low tide.	Among grass		1885		H. Hemphill	1	14942	
E. side of Loggerhead Key.						June 29, 1932	24	W. L. Schmitt	1 ♀	71114	
W. of Loggerhead Key.						Aug. 20, 1930		Do	1 ♂	69315	Gift of Carnegie Institution. Disgorged by hooked croaker 18 inches long.
Key West								C. J. Maynard	1 ♂	56806	From Boston Soc. Nat. Hist.
Do								U. S. Bureau of Fisheries.	1 ♂	60447	
Bush Key, Tortugas.						June 1921		Paul Bartsch	1 ♀	57129	
S. end of Bush Key Reef.						July 31, 1924		W. L. Schmitt	1 carapace	66379	Gift of Carnegie Institution.
Do						do		do	Fragments of carapace.	66351	Do.
Tortugas						Aug. 19, 1924		do	2 carapaces	66377	Do.
Do						1924	8	H. B. Bender	1 ♀ y	66412	Do.
Do						June 1925		D. Thompson	1 ♂	66352	Do.
Do						do		do	1 ♂	66367	Do.
Do				Stomach of red grouper, *Epinephelus morio*.		July 2, 1931	809	H. W. Manter	1 ♀	68141	Do.
Do				From fish trap set over night.		July 17, 18, 1931		W. L. Schmitt	1 ♂, soft shell	66360	Do.
Do	E. Channel parallel White shoal					June 25, 1932	19	do	1 carapace	67753	Do.
Do				From stomach of grouper.		1932		do	1 ♂	66354	Do.
Do				do		July 29, 1932		do	1 ♀	66360	Do.
Do						1934		H. H. Darby	1 ♂	71063	Do.
Do								W. H. Longley	1 ♀	66358	
Do								W. L. Schmitt	1 ♀, 1 half digested.	66361	Gift of Carnegie Institution.

Bird Key Reef								June 20, 1925		do	1 ♂	66368	Do.
Tortugas								1893		State Univ. Iowa Bahama Exped.		S. U. I.	
Tortugas Reefs										J. B. Henderson	1 ♀ y	68527	
BAHAMAS:													
Abaco Island					3–15					Allen, Bryant, and Barbour.	1 ♀	M. C. Z.	
Clarence Harbor								July 15, 1903		B. A. Bean	1 ♀	31084	Geogr. Soc. Baltimore.
CUBA:													
Reef Lavesos Italienos.					2–3	M. Co.		June 2, 1914	14	Henderson and Bartsch.	1 y	48528	*Tomas Barrera* Exped.
Bahia Honda						do		June 4–5, 1914	15	do	1 ♂	48504	Do.
Between Cayo Hutia and Little Cayo.	NE of Light					On reef flat				do	1 y	48514	Do.
JAMAICA:													
Port Royal										P. W. Jarvis		Inst. Jamaica.	
Bull Bay										C. R. Orcutt	1 ♂	66376	
Hope Bay										do	1 ♀	68142	
HAITI:													
Torbeck										do	1 ♂	66374	
Robins Bay										do	1 ♀	66378	
PUERTO RICO:													
N. of	18	31	30	66 14 55	120			Mar. 8, 1933	105	Johnson-Smithsonian Exped.	Fragment of palm.	67828	
Playa de Ponce, Lighthouse Reef.								Jan. 31, 1899		*Fish Hawk*	1 ♂	24080	
Off Humacao, Village of Hucares.					12½			Feb. 8, 1899	170 (6098)	do	1 ♀	24081	
ST. CROIX										Harry A. Beatty	1 ♂	69314	
ST. MARTIN: Philips Bay.					Beach			June, 1905		Dr. Shaw	1 ♂	Leiden Mus.	
DOMINICA: Off Roseau					30					A. H. Verrill	1 ♀	32718	
BARBADOS: Pelican Island.						In fish pot		1918		State Univ. Iowa Barbados-Antigua Exped.	1 ♀	S. U. I.	
MEXICO: Campeche Snapper Banks.										Joseph Lee	1		Returned to sender.
PANAMA: Colon						Coral reef		May 2, 1911		Meek & Hildebrand.	1 ♂	43996	
CURAÇAO:													
Rifwater					Shallow	Algae		May 26, 1905		J. Boeke	1 ♂ y	Amsterdam Mus.	
Caracas Bay						Seine		Apr. 8, 1920		C. J. van der Horst.	1 ♂	do	
Curaçao								Feb. 10–18, 1884		*Albatross*	1 ♂	18540	
BONAIRE:													
Kralendijk										P. Hummelinck	1 ♀	Amsterdam Mus.	

TABLE 70.—*Material examined of* Calappa gallus—Continued

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
	° ′ ″	° ′ ″			° C.						
BERMUDA:											
Castle Harbor								W. Faxon	1 ♂	6410, M. C. Z.	
Bermuda						Aug. 1, 1903			1 ♂	M. C. Z.	
BRAZIL:	*Latitude S.*										
Bahia						Dec. 21, 1887		*Albatross*	1 ♀	22124	
Do										Copenhagen Mus.	
INDIAN OCEAN:											
Salomon Atoll, western Indian Ocean.						1905		H. M. S. *Sealark*; J. Stanley Gardiner.	1 ♀	41054	Copenhagen Mus.
Indian Ocean								W. L. Abbott	1 ♂	17752	
Mauritius								H. A. Ward	1 ♀	17831	
	Latitude N.										
Calcutta						Feb., 1866		W. Theobald	2 y	6407, M. C. Z.	
Nallandu Island, Meldive Islands.			24			Jan. 18, 1902			1 y	6717, M. C. Z.	
PHILIPPINE ISLANDS:		*Longitude E.*									
Off Tinakta Island, Tawi-Tawi Group.	5 12 00	119 54 30	12	crs. S. Sh		Feb. 21, 1908	5158	*Albatross*	2	65362	
Do	5 11 50	119 54 00	10	Co. S		do	5159	do	1	65363	
Off Observation Island, Tawi-Tawi Group.	5 03 40	119 52 20	18	gn. M		Feb. 24, 1908	5164	do	1	65360	
Do	4 58 20	119 50 30	9	Co.		do	5165	do	3	65389	
Off Anima Sola Island, between Burias and Luzon.	13 11 15	123 02 45	20	crs. S.		Apr. 22, 1908	5218	do	1	65361	
FORMOSA: Takao.						Dec. 3 & 4, 1914.		Fred Baker	1	47933	
JAPAN: Tara, Ibusuki, Satuma.								T. Urita	1 ♂		Returned to sender.
MARSHALL ISLANDS:						1877		B. G. Snow	4 ♀	6409, M. C. Z.	
Ebon											

HAWAIIAN ISLANDS:										
Near Modu Manu or Bird Island.		30-31	crs. co. S. brk. Sh. For.	78.3	Aug. 7, 1902	4159	*Albatross*	1 claw	29893	
S. coast of Molakai Island.		43-66	crs. S. brk. Sh. Co.	71.7	Apr. 8, 1902	3850	do	1 y	29891	
NE. coast of Hawaii Island.		24-83	Co. S. corln. Nod. For.		July 18, 1902	4061	do	1 ♂	29892	
Maui							Dr. Winslow	1 ♀	53039	Boston Soc. Nat. Hist.
Hilo, Hawaii							H. W. Henshaw	1 ♀	23088	
Kawai, Hawaii							A. Garrett	1 ♂ 4 ♀	712, M. C. Z.	
	Latitude S.									
SAMOA: Upolu									Copenhagen Mus.	

MURSIA GAUDICHAUDII (Milne Edwards)

PLATE 66, FIGURES 1–3; PLATE 67, FIGURES 1–6

Platymera gaudichaudii MILNE EDWARDS, Histoire naturelle des Crustacés, vol. 2, p. 108, 1837 (type locality, Chile; type in Paris Mus.).—MILNE EDWARDS and LUCAS, *in* d'Orbigny's Voyage dans l'Amérique méridionale, vol. 6, p. 28, 1843; vol. 9, atlas, pl. 13, fig. 1, 1847.

Platymera californiensis RATHBUN, Proc. U. S. Nat. Mus., vol. 16, p. 253, 1893 (type locality, off Point Ano Nuevo, Calif., 70 fathoms; type, U. S. N. M. no. 15606).

Platymera gaudichaudi PORTER, Rev. Chil. Hist. Nat., vol. 25, p. 421, pl. 38, 1921.

Diagnosis.—Posterior margin of carapace entire; lateral spine pointing directly outward. Two spines on distal crest of arm; ridge on lower part of manus unidentate.

Description.—Carapace densely granulate. Nine short rows of a few tubercles each: one row median, one protogastric (paired), the remainder branchial. On the front a pair of thick divergent teeth; behind them a depressed tooth forming inner angle of orbit and above that a blunt tooth. Anterolateral margin with from 14–17 very small teeth separated by concave lines of granules, the interspaces greater at middle of carapace arch than toward either end. Six teeth pointing distad on upper margin of manus; above the lower margin a prominent granulate and unidentate ridge; at middle of manus a line of five or six tubercles separated by coarse granules. Dactyli of ambulatories long, slender, carinated. On the sternum at base of chelipeds a large blunt downward pointing pyramidal tooth.

Color.—Ochraceous; tubercles and spines of carapace and stripes on ambulatories rufous. (Milne Edwards and Lucas.) Broccoli brown with spines and tubercles ochraceous. Hands lighter than carapace, lower margins white. (W. L. Schmitt.)

Measurements.—Male type (15606), length of carapace 64, width to base of spine 95, length of spine 14 mm.

Range.—California to Chile; 26 to 218 fathoms.

Material examined.—See table 71, page 222.

Genus ACANTHOCARPUS Stimpson

Acanthocarpus STIMPSON, Bull. Mus. Comp. Zool., vol. 2, p. 152, 1871 (type *A. alexandri* Stimpson).

Body regularly ovate, strongly convex in its anteroposterior dorsal outline. Carapace as broad as long, broadest in front. Anterolateral continuous with posterolateral margin; the latter armed with a strong tooth. Fronto-orbital region more or less than one-third width of carapace. Eyes large. External maxillipeds not reaching to anterior extremity of buccal area; ischium truncate in front, without projecting at inner angle, which, like the outer one, is a right angle; merus shorter and broader than ischium, and narrowed in front, with the palpus attached at the antero-interior angle; exognath

reaching to tip of merus or nearly so. Chelipeds with a great spine on merus (not carpus) placed in a horizontal plane and pointing outward in a direction exactly transverse to axis of body. Ambulatory legs with slender dactyli.

From Massachusetts to the Windward Islands.

KEY TO THE SPECIES OF THE GENUS ACANTHOCARPUS

A.[1] Carapace narrowing in posterior half; a short spine on posterolateral margin ..... **alexandri** (p. 221)

A.[2] Carapace subcircular; a long spine on posterolateral margin. **bispinosus** (p. 224)

ACANTHOCARPUS ALEXANDRI Stimpson

PLATE 69, FIGURES 1, 2

Acanthocarpus alexandri STIMPSON, Bull. Mus. Comp. Zool., vol. 2, p. 153, 1871 (type locality, off the Quicksands, Florida Keys, 74 fathoms; type not extant).—A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 19, pl. 1, fig. 2, 1880.—S. I. SMITH, Proc. U. S. Nat. Mus., vol. 3, p. 418, 1881; Bull. Mus. Comp. Zool., vol. 10, p. 7, 1882.—A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 27, p. 126, pl. 24, figs. 9–11; pl. 25, fig. 7, 1902.—SCHMITT, Carnegie Inst. Washington Year Book, no. 30 (1930–31), p. 393, 1931.

Diagnosis.—Carapace ovate, with a short posterolateral spine. Posterolateral margin not tuberculate. A tooth on posterior margin and a conical tubercle on sternal plastron.

Description.—Carapace regularly convex, widest in anterior half, surface uneven, the protuberances arranged obscurely in five longitudinal rows anteriorly, the middle ones of which form centrally and posteriorly three conspicuous ridges, the lateral ridges terminating in the spines of the posterolateral margin. Surface covered with minute granules and punctae. Posterior margin arcuate, bearing a prominent tooth at middle and a slight wave in the outline on either side. Anterolateral margin with four slight tuberculiform teeth. Orbits large, without fissures except the inner superior one which is nearly obsolete; orbital margin ciliated. Front of moderate width, trilobed in dorsal view, separated by a notch from the orbit.

The spine at outer angle of merus may be a little longer or shorter than half the width of carapace; the superior spine is one-fourth to one-third as long as the inferior. Hand with a 7-toothed crest above and another, oblique, 6-toothed crest on outer surface, extending from base of dactylus to postero-inferior angle. On the latter crest the posterior tooth is largest and forms by itself a short crest, separated from the other teeth by a considerable interval. Between the upper and lower crests of hand there are six or seven scattered tubercles.

Stridulating ridge on inner surface composed of about 45 oblique striae closely placed. Ambulatory legs naked, unarmed, with smooth polished surface. A conicle tubercle on either side of first article of sternal plastron.

TABLE 71.—*Material examined of* Mursia gaudichaudii

Locality	Bearings: Latitude N.			Bearings: Longitude W.			Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	°	′	″	°	′	″			°F.						
CALIFORNIA:															
Gulf of the Farallones.	37	43	20	122	43	00	29	crs. S	50.4	Mar. 10, 1890	3100	*Albatross*	1 ♂	15609	
Do	37	38	00	123	02	30	67	fne. dk. S	57.9	do	3103	do	1 ♂ 1 ♀	15607	
Off Half Moon Bay.	37	21	00	122	51	00	77	fne. gy. S		Mar. 11, 1890	3106	do	2 ♂ 1 ♀	15605	
Off Point Ano Nuevo.	37	08	00	122	28	00	47	br. M	51.3	Mar. 15, 1890	3148	do	5 y	15614	
Do	37	06	40	122	37	30	70	fne. gy. S	48.8	Mar. 12, 1890	3113	do	2 ♂	15606	1 is type.
Do	37	05	00	122	24	00	43	fne. bk. S		do	3115	do	1 ♂ 1 ♀ 3 y	15604 15610	
Do	37	00	30	122	35	30	108	fne. gy. S	45.8	Apr. 12, 1890	3207	do	1 ♂ 34 ♀ 1 ♂ 3 ♀	15603 4265, M.C. Z	
Do	37	00	00	122	20	00	56	br. M	49.2	Mar. 15, 1890	3147	do	9 y	15611	
Off Santa Cruz	36	54	45	122	20	15	202	bk. S	44.1	Apr. 12, 1890	3204	do	1 y	15612	
Do	36	53	30	122	12	00	62	gn. M. R	49.5	Mar. 15, 1890	3146	do	7 y	15613	
Off Monterey Bay.	36	39	40	122	01	00	20	S. M	43.7	Mar. 13, 1890	3129	do	2 ♂ 2 ♀	15608	
Monterey Bay	Point Pinos Light House, 5.73° E. 4 mi.						73	gn. M. R		June 9, 1904	4552	do	1 y	50473	
Do	Point Pinos Light House, S. 21° W. 3.4 mi.						49	gn. M. fne. S	48.5	May 11, 1904	4452	do	1 ♂ 1 ♀	50476	
Do							80	M		June 26, 1930	124.1	Pacific Biological Laboratories.	1 ♂	71066	
Off Cape San Martin.	35	45	30	121	29	00	218	M	43.2	Apr. 4, 1890	3189	*Albatross*	1 ♂	22297	
Off Santa Barbara.	34	20	40	119	37	45	26	gy. S. P. St	58	Feb. 11, 1889	2969	do	1 y	17167	
Do	34	20	20	119	37	30	59.1	fne. gy. S. M	29	do	2970	do	4 y	16038	
Off San Miguel Island.	34	07	00	120	33	30	53	brk. Sh. S	55.6	Jan. 5, 1889	2894	do	1 y	50964	
Off Anacapa Island.	33	59	45	119	22	15	46	gy. S	56.5	Feb. 12, 1889	2978	do	1	16039	
Off Santa Rosa Island.	33	57	30	120	18	30	52	fne. gy. S. R	53.1	Feb. 8, 1889	2956	do	2 y	16775	
Do	33	47	00	119	58	15	82	gy. S. brk. Sh		do	2953	do	1	16037	

Near Rocky Point.			12			May 17, 1924		Univ. Southern Calif.	1 ♂	Returned to sender.	
Off Catalina Island.			50					H. N. Lowe	3 y	29942	
Off San Nicolas Island.	E. point S. 6° W. 2.5 mi.		31	gy. S. Sh		Apr. 13, 1904	4422	*Albatross*	7 y	50475	
Do	E. point S. 77° W. 5.7 mi.		33	fne. gy. S		Apr. 12, 1904	4420	do	1 ♂ 1 ♀ (y)	50474	
Do	E. end					Aug. 26, 1932	D. 33. R	*Zaca*; Crocker Exped.	2 ♀	Cal. Acad. Sci	
Off Cortes Bank	32 27 15	119 05 15	47	fne. gy. S	57.1	Jan. 17, 1889	2922	*Albatross*	3	16036	
Do	32 27 00	119 14 15	145	fne. gy. S	51.5	do	2921	do	8	16035	
Edge of Cortes Bank.	*32 22 30*	*119 03 30*	*67*	*fne. gy. S*	*52.4*	Jan. 16, 1889	2918	do	4	16034	
Do	32 22 30	119 03 30	90	fne. gy. S. brk. Sh.	40.1	do	2917	do	2 y	50965	
Southern California.							D. 2	*Anton Dohrn*	1 y. carapace.	50265	Gift of Venice Mar. Biol. Sta.
MEXICO; Lower California:											
San Martin Island.			25	sdy		Aug. 21, 1932	D. 30 R.	*Zaca*; Crocker Exped.	1 ♀	Calif. Acad. Sci	
Thurloe Bay			30			Mar. 9, 1934	285	*Velero III*	1 ♂ y	69225	Color note. Hancock Galapagos Exped.
Off Abreojos Point.	26 14 00	113 13 00	48	yl. M	53.9	May 3, 1888	2834	*Albatross*	1 ♂ 1 ♀	22128	
PANAMA:											
Bay of Panama	8 16 30	79 37 45	47	gn. M		Mar. 30, 1888	2804	do	11 ♂ 17 ♀	22126	
Do	7 56 00	79 41 30	51½	gn. M		do	2805	do	4 ♂ 4 ♀	22127	
Do	7 40 00	79 17 50	127	fne. gy. S	56.2	Mar. 8, 1891	3387	do	1 ♂ 1 ♂	20628 4496, M. C. Z	
ECUADOR; Galapagos Islands.	*Latitude S* 0 5 00	90 30 00	70	S		Jan. 26, 1934	191	*Velero III*	3 y	69224	Hancock Galapagos Exped.
CHILE:											
From Province of Aconcagua to Province of Talca.								C. E. Porter	1 ♀	50504	
Valparaiso									1 ♂	Copenhagen Mus.	
Do									1 ♀	20284	Cotype, from Paris Mus.

Color.—Dorsal surface of carapace and chelipeds pale reddish orange, deepest in color upon elevations of carapace and upon bases of meral spines of chelipeds; carapace beneath, the sternum, abdomen, and under surfaces of chelipeds and legs are white very slightly tinged with reddish.

Measurements.—Male, Tortugas, station 21, 1932, length of carapace 43; width 42; length of larger meral spine measured from sinus 20; length of smaller meral spine 5 mm.

Range.—From Massachusetts to the Windward Islands; 45 to 208 fathoms.

Material examined.—See table 72, page 226.

ACANTHOCARPUS BISPINOSUS A. Milne Edwards

PLATE 68, FIGURES 1–3

Acanthocarpus bispinosus A. MILNE EDWARDS, Bull. Mus. Comp. Zool., vol. 8, p. 19, pl. 1, fig. 1, 1880 (type locality, reefs of the Grenadines, 140 fathoms; holotype in M. C. Z.).—A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 27, p. 127, pl. 24, fig. 12; pl. 25, figs. 4–6, 1902.—SCHMITT, Carnegie Inst. Washington Year Book, no. 31 (1931–32), p. 288, 1932.

Diagnosis.—Carapace circular, with a long lateral spine. Posterolateral margin tuberculate. No tooth on posterior margin and no conical tubercle on sternal plastron.

Description.—Carapace more circular and more coarsely granulate than in *alexandri*, rostral teeth longer, posterolateral border furnished with a series of tubercles behind the spine; posterior border less produced on median line; no conical tubercle on first article of sternal plastron. A dense fringe of hair on exognath of outer maxillipeds. Meral spine more than half as long as width of carapace; hands coarsely granulate, outer crest not prominent; striae of stridulating ridge about 60, being finer and more numerous than in *alexandri*. When touched or taken in the fingers under water, the crab may set up such a vibratory grating of the hand against the suborbital tubercles as to make one's fingers literally tingle.

Color (66386).—Ground color of hinder third of carapace (behind lateral spines) pale rose pink. Small spots and narrow strips defining middle third of carapace light lavender gray. Anterior two-thirds of carapace heavily spotted and speckled with scarlet-vermilion; longitudinally shaded portions of spines the same but tinged with orange-chrome; extreme tip whitish. Lower half of chelae rose-pink, upper half darker, appearance due to scattered red specks on some of granules; teeth at top of chelae dirty white, fingers almost china white. Ground color of legs rose-pink toward lower margins, which are more a peach-blossom pink, upper margin nearly white; on anterior face of

third, fourth, and fifth carpus and at distal end of merus a few red reticulations (color of red on carapace). (W. L. Schmitt.)

Measurements.—Male, Tortugas (66385), length of carapace 56.3, width 59, length of carapace spine 31.5, length of meral spine 35.6 mm.

Range.—Florida Straits to Windward Islands; 135 to 197 fathoms.

Material examined.—See table 73, page 228.

Genus CYCLOËS De Haan

Cycloës De Haan, Fauna Japonica, Crustacea, pp. 67, 68, 1837 (type, *C. granulosa* De Haan).

Cryptosoma Brullé, *in* Barker-Webb and Berthelot's Histoire naturelle des Iles Canaries, vol. 2, pt. 2, Crust., p. 16, 1840 (type, *C. dentatum* Brullé, p. 17= *C. cristatum* Brullé, pl. 1, fig. 2).

Carapace heart-shaped or subcircular. Front narrow, emarginate. Orbits large, oval, a distinct suture or a fissure in the roof and two gaps in the floor, in one of which the slender basal-antennary article is lodged. Eyes large, eyestalks short and thick. Antennules folding obliquely. The external maxillipeds close the buccal cavity; the antero-internal angle of the merus is prolonged obliquely forward to form a prominent lobule above articulation of palp. The endostomial efferent branchial channel is closed by lamellar processes from first pair of maxillipeds. Chelipeds similar to those of *Calappa*. Ambulatory legs compressed and of moderate size. Third, fourth, and fifth segments of abdomen in male fused, in female all are distinct.

West and east coasts of America; east Atlantic, Indian, and Pacific Oceans.

CYCLOËS BAIRDII Stimpson

Plate 69, Figures 3, 4

Cyclois bairdii Stimpson, Ann. Lyc. Nat. Hist. New York, vol. 7, p. 237 [109], 1860 (type locality, Cape St. Lucas; cotypes, U.S.N.M. no. 2001).—Verrill, Trans. Connecticut Acad. Sci., vol. 11, p. 18, pl. 2, figs. 1, 2, 1901.

Mursia balguerii Desbonne, *in* Desbonne and Schramm, Crustacés de la Guadeloupe, etc., p. 52, pl. 4, fig. 20, 1867 (type locality, Guadeloupe; type not extant).

Cyclois balguerii Stimpson, Bull. Mus. Comp. Zool., vol. 2, p. 152, 1871.

Cycloës bairdii Rathbun, Proc. U. S. Nat. Mus., vol. 21, p. 610, 1898; Bull. U. S. Fish Comm. for 1900, vol. 20, pt. 2, p. 85, 1901.—Verrill, Trans. Connecticut Acad. Sci., vol. 13, pl. 27, fig. 2, 1908.—Finnegan, Journ. Linn. Soc., London, Zool., vol. 37, p. 613, 1931.

Cycloës bairdii var. *atlantica* Verrill, Trans. Connecticut Acad. Sci., vol. 13, p. 423, figs. 46, 47, 1908 (type locality, Bermuda; type in Yale Mus.).

Diagnosis.—Broader than long. A small posterolateral spine behind middle of carapace. A short deep furrow either side of middle is continued forward less conspicuously to the median interorbital groove.

TABLE 72.—*Material examined of* Acanthocarpus alexandri

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Depth	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″	*Fathoms*		°*F.*						
MASSACHUSETTS:											
Georges Bank	40 07 00	69 46 00	57			Aug. 21, 1913	10109	*Grampus*	1 ♀	50978	
Off Marthas Vineyard.	40 02 36	70 22 58	155	M. fne. S		Sept. 4, 1880	870	*Fish Hawk*	2 y	18800	
Do	40 02 54	70 23 40	115	M. fne. S	49	do	871	do	2 ♂ 1 ♀	18801	
Do	39 55 00	70 54 15	142½	M	52	Sept. 13, 1880	878	do	10+	18803	
Do	39 56 00	70 54 18	126	sft. stky. M	57	do	877	do	8	18802	
									2 y	3292, M.C.Z.	
Do	40 00 00	70 57 00	85	sft. stky. M	51	do	874	do	2	7311	
Do	40 10 15	71 04 30	71	gn. M. brk. Sh. S	51	1880	345	*Blake*	1 ♂ soft shell	3185, M.C.Z.	
Do	40 01 00	71 14 30	128	M. S. Sh	51	Aug. 9, 1881	944	*Fish Hawk*	1 ♂ 1 ♀	4574	
NORTH CAROLINA:											
Between Capes Hatteras and Lookout.	34 39 15	75 33 30	107	gy. S. P		Oct. 18, 1885	2601	*Albatross*	1 ♀ y	11210	
Do	34 38 30	75 33 30	124	S. R		do	2602	do	1 ♂	18449	
Off Cape Lookout.	34 09 00	76 02 00	168	gy. S. bk. Sp		Oct. 19, 1885	2614	do	1 ♂	11226	
SOUTH CAROLINA:											
Off Charleston	32° 10′ to 11′	79° 07′ to 04′	102	gn. M. S		Dec. 9, 1919	20035	do	2 y	68602	
FLORIDA:											
Off Fowey Rocks			80			1916		J. B. Henderson	1 y	66463	
SE. of Fowey Rocks.			90					do	2 y	66465	
Off Sombrero Key.			47			Apr. 2, 1872	1st cast.	Wm. Stimpson	4	2992, M.C.Z.	
SE. of Key West			61					J. B. Henderson	1 y	68531	
S. of Key West			90					do	1 ♀	68510	
Tortugas	Abt. 15 mi. S. of no. 2 red buoy.		75			July 22, 1924	41	W. L. Schmitt	1 ♂	66405	Gift of Carnegie Institution.
Do	Abt. 13 do		45			June 10, 1925	210	do	1 ♂	66409	Do.
Do	Abt. 13 do		80			July 13, 1930	10	do	40+ (2 jars)	66401	Do.
Do	Abt. 14 do		80–60			July 15, 1930	12	do	100+	66416	Do.
Do	Abt. 15 do		80–150			do	13	do	1 ♀	66410	Do.
Do	Abt. 15 do		100			do	14	do	9 y	66400	Do.
									20+	66399	Do.
Do	Abt. 13 do		80–100			July 29, 1930	35	do	13+	66403	Do.
Do	Abt. 12 do		60			July 22, 1931	33	do	6 ♂ 3 ♀	66398	Do.
Do	S. of no. 2 red buoy		117			Aug. 3, 1931		do	3 ♂	66411	Do.
Do	Abt. 13 mi. S. of no. 2 red buoy.		72–60			June 26, 1932	21	do	2 ♂ 2 ♀ (1 ovig.)	66404	Do.

Do	Abt. 16 do						125–65				June 30, 1932	25	do	30+ 3 ♀ (2 ovig.)	66395 66406	Do.
Do	S. of Tortugas						60				do		do	40+	66394	Do.
Do	Abt. 16 mi. S. of no. 2 red buoy.						140–79				July 2, 1932	29	do	2 ♂ 2 ♀	66402	Do.
Do	Abt. 17 do						156–135				do	33	do	3 ♂ 3 ♀	66397	Do.
Do	Abt. 18 do						168				July 19, 1932	55	do	9 ♂	66391	Do.
Do	Abt. 14 do						92–94				July 23, 1932	57	do	2 ♂ 7 ♀	66390	Do.
Do	Abt. 14 do						94–83				do	58	do	40+ 2 y	66393 66396	Do.
Do	Abt. 13 do						83–91				do	59	do	5 ♂ 7 ♀	66392	Do.
Do	Abt. 16 do						138–140				Aug. 1, 1932	66	do	2 ♂	66407	Do.
Do	Abt. 16 do						130–142				Aug. 5, 1932	72	do	12 y	66408	Do.
							Feet									
Do							220				1934		H. H. Darby	5 ♂ 8 ♀	71607	Do.
							Fathoms									
Do											1931		Paul Bartsch	2 ♂ 1 ♀ y ♀ soft shell	67860	Do.
West coast of Florida.	28	36	00	85	33	30	111	gy. M			Mar. 14, 1885	2402	*Albatross*	10 ♂ 15 ♀	9760	
Do	28	38	30	85	52	30	142	gn. M, brk. Sh			do	2401	do	2 ♂ 2 ♀	9753	1 ♂ with *Pettogaster*.
Do	28	41	00	86	07	00	169	gy. M			do	2400	do	1 ♂ 1 ♀	14947	
Do	28	42	30	85	29	00	88	gy. M			Mar. 15, 1885	2403	do	6 ♂ 1 ♀ 8 y	9770	
Do	28	44	00	85	16	00	60	gy. S			do	2404	do	2 y	14978	
Do	29	14	30	88	09	30	68	gy. M			Feb. 11, 1885	2378	do	1 ♂ 1 ♀	9655	
West Indies:																
Off West coast of Puerto Rico.	18	24	45	67	14	15	80–180				Feb. 9, 1933	35	Johnson-Smithsonian Exped.	1 ♂	67804	
Off Saba Bank	17	30	00	63	43	30	150			63¼	1878–'79	143	*Blake*	2	2919, M.C.Z.	
Off St. Kitts							308	fne. S, blk. Sp		55¼	do	148	do	1 ♂ 1 ♀	4460, M.C.Z.	
Do							60–150	fne. Oz, lava Sp		76	do	149	do	1 ♂	4460, M.C.Z.	
Off Cannouan, Grenadines.							127	fne. Co. S		56	do	238	do	2	2644, M.C.Z.	

TABLE 73.—*Material examined of* Acanthocarpus bispinosus

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
FLORIDA:	° ′ ″	° ′ ″									
Tortugas						1931		Paul Baitsch	1♂2♀	66389	Gift of Carnegie Institution.
Do	About 17 mi. S. of no. 2 red buoy.		156–135			July 2, 1931	30	W. L. Schmitt	5♀	66386	Do.
Do	About 18 mi. S. of no. 2 red buoy.		168			July 19, 1932	55	do	1♂	66385	Gift of Carnegie Institution. With stalked barnacles, *Poecilasma inaequilaterale* Pilsbry.
Do	About 16 mi. S. of no. 2 red buoy.		140–197			Aug. 1, 1932	67	do	2♀	66388	Gift of Carnegie Institution.
Do	do		197–197			do	68	do	1♀	66387	Do.
WINDWARD ISLANDS: Grenadines			140			1880	240	*Blake*	1♂	M. C. Z.	Holotype.

Description.—Carapace slightly broader than long, regularly convex, median regions well defined. Surface densely and coarsely granulate, uneven or tuberculate, the tubercles arranged partly in longitudinal rows. In the young the tubercles are higher than in the old. Front with subtriangular, blunt, median notch, each tooth with a slight lobe or tooth on outer edge. Anterolateral margin with a beaded edge; five or six denticles behind orbit; a short sharp tooth or spine at lateral angle. Carapace widest in front of spine. Margin of arm expansion tridentate and continuous with the longitudinal crest on palm which is unidentate. Nine teeth on upper margin of palm; three oblique but irregular rows of tubercles on outer surface.

Measurements.—Largest specimen, female (22125), length of carapace 45.8, greatest width 49, width between tips of lateral spines 47.5 mm.

Color.—Bright in life. Carapace pale yellow or whitish with lemon-yellow spots in irregular rows, and many small bright red or crimson spots, especially laterally. Chelipeds and legs bright yellow, spotted and banded with bright scarlet-red; chelae with a crescent of red at the articulation of the dactylus on the inside; tips of digits and teeth of dorsal crest of manus red; carpus with two red spots. Legs bright yellow, with bands of red and purple, and purplish red margins on the merus; eyestalks orange. (Verrill.)

Coral sand white with faint brownish markings, cinnamon or pale hazel; markings sometimes inconspicuous. (Station 25, Hancock Galapagos expedition.)

Upper surface of carapace cream-buff, spines and tubercles white with hinder two-thirds of larger tubercles margined with purple. Eyestalks cream-buff with tinge of maize yellow, corneae gray with tinge of salmon buff. Chelipeds white outside with some purple spots; inside white with large maroon spot at distal end of manus; hazel spot on carpus at middle of outside near upper margin. Dactyli and propodi of ambulatories citron yellow, carpal joints with auricula purple in a line on each side united across upper margin proximally; first leg has a little spot on hind side of propodus, merus with a large splotch of purple on same side. (W. L. Schmitt.)

Variation.—The intermediate crab of the three largest *Cycloës* from station 257 is different from the others; the eyestalks are basally purple, the carapace smoother, lateral spines whiter and stronger, a conspicuous white spine on the carpus of the cheliped; and the surface has finer and fewer red specks. A fourth specimen, the smallest, is like the intermediate.

Habit.—Burrows in sand.

Range.—West coast of Mexico to Ecuador and the Galapagos Islands; North Carolina to Caribbean Sea; Bermudas; 1½ to 45 fathoms; 125 fathoms (Henderson).

Material examined.—See table 74, page 230.

TABLE 74.—*Material examined of* Cycloës bairdii

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Depth	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
Pacific coast of America											
WEST COAST OF MEXICO:	° ′ ″	° ′ ″	*Fathoms*								
Cape St. Lucas								John Xantus	10 cotypes	2001	
									1 ♀ do	46204	
									2 ♂ 2 ♀ do	1361, M. C. Z.	
Do						Mar. 23, 1911		*Albatross*	2 ♂ 1 ♀	60002	
Off Cape St. Lucas.						Aug. 6, 1932	D. 21. R.	*Zaca;* Crocker Expod.	1 ♂ 5 y	Calif. Acad. Sci.	
Do	23 02 00	109 33 00	25	Rock fragments		Aug. 5, 1932	D. 20. R.	do	1 ♀	do	
Do	23 00 00 to 23 06 00	109 36 00 to 109 31 00				Aug. 4, 1932	D. 18. R.	do	4 y	do	
Isabel Island	All around isle		10–25			Mar. 5, 1934	277	*Velero III*	1 ♂ 10 y	69170	Hancock Galapagos Exped.
Tres Marias Islands.						Feb. 1930		H. N. Lowe	2 y	68450	
Socorro Island			20			Jan. 4, 1934	133	*Velero III*	1 ♂ 5 y	69175	Hancock Galapagos Exped.
Do	Braithwaite Bay		14–18			Jan. 3, 1934	129	do	3 y, frag. of 1 lge.	69336	Do.
Clarion Island	Sulphur Bay		25	S		Jan. 5, 1934	135	do	1 chela	69169	Do.
Tenacatita Bay, Jalisco.			2–3			Mar. 18, 1933	122	do	Fragment of carapace.	68017	Do. Do.
Do	Between white rocks and bay.		25			Mar. 4, 1934	272	do	1 ♀ 14 y	69176	
Do	Between anchorage and bay.		10			do	271	do	2 y	69618	1 from fish stomach. Hancock Galapagos Exped.
Manzanillo								H. N. Lowe	1 y	68451	
Petatlan Bay	S. shore of bay		5–10			Mar. 3, 1934	265	*Velero III*	4 y	69180	Hancock Galapagos Exped.
Do	Halfway to White Friars Islands.		25			do	267	do	1 ♀	69223	Do.
Do	N. end of White Friars Islands.		25	S		do	268	do	2 y	69183	Do.
Acapulco						April, 1930		H. N. Lowe	2 ♂ 4 ♀	66444	
Tangola-Tangola, Oaxaca.	Tangola-Tangola Bay		15–20			Feb. 28, 1934	259	*Velero III*	1 ♀ 38 y	69173	Hancock Galapagos Exped.

COSTA RICA:											
Puerto Culebra	In bay	10			Feb. 24, 1934	253	*Velero III*	1 ♂ y	69164		Do.
Do	do	3–10			do	254	do	9 y	69166		Do.
Do	Dredging around isles in bay.				Feb. 25, 1934	257	do	4 ♂ 10 y	69174		Do.
Cocos Island	Wafer Bay	2–4			Mar. 2, 1933	108	do	2 y	68022		Do.
PANAMA:											
Bahia Honda	Outside of isle S. of bay	15–20			Feb. 22, 1934	249	do	Fragment of chela.	69157		Do.
Bay of Panama	*8 05 00 | 78 51 00*	*33*	*gy. S. brk. Sh*		*Mar. 5, 1888*	*2796*	*Albatross*	1 ♂	22125		
COLOMBIA:											
Utria	Outside of terminal island.	15–20	S. Sea-urchins		Feb. 14, 1934	235	*Velero III*	1 y, broken	69162		Do.
Cabita Bay, Cape Corrientes.	Near point	10			Feb. 13, 1934	231	do	2 y	69161		Do.
Gorgona Island	*West side*	*20*			*Feb. 12, 1934*	*226*	*do*	*1 ♂ y*	*69159*		*Do.*
Do	Near Gorgonilla Channel.	15	M		do	228	do	25 y	69168		Do.
Do	N. end of isle	20			do	221	do	10 y	69266		Do.
Do	do	Shore			do	218	do	2 y	69327		Do.
Do		Dredged			do	223	do	7 y	69617		Do.
ECUADOR:	*Latitude S.*										
La Plata Island					*Jan. 22, 1933*	*23*	*do*	*2 y (1 soft shell)*	*68023*		*Do.*
Do	N. of anchorage	7–10	rky		Feb. 10, 1934	213	do	1 ♀ 8 y	69167		Do.
La Libertad		8–12	S. Sh		Feb. 8, 1934	205	do	1 ♂	69158		Do.
Galapagos Islands:											
Albemarle Island.	Tagus Cove				May 6, 1932		Garth Basford.	1 ♂	Cal. Acad. Sci.		Crocker Exped. In stomach of *Cautolatilus princeps*; crab alive when taken.
Do	North end				Jan. 12, 1934	88	H. W. Manter.	3 ♂ 2 ♀ (y)	69165		Hancock Galapagos Exped.
Do	do				do	90	do	2 ♂	69172		Do.
Indefatigable Island	Conway Bay, bet. Eden Id. & ship	5–11			Feb. 16, 1933	81	*Velero III*	1 broken, soft shell.		68018	Do.
Hood Island	Gardner Bay	2–3	Sand beach		Jan. 24, 1933	25	do	3 y		68019	Do.
Do	do	30	sdy		Jan. 31, 1934	204	do	1 ♀ 2 juv. 1 chelped		69171	Do.
Charles Island.	Postoffice Bay	2–3			Feb. 6, 1933	57	do	2 y		68020	Do.
Do	Dredged N. of island	8–10	rky		Jan. 29, 1934	196	do	1 y		69759	Do., soft shell.
South Seymour Island.		11–13			Feb. 18, 1933	84	do	2 y		68021	Hancock Galapagos Exped.
Do	Velero Bay	5			Jan. 22, 1934	173	do	5 y		69329	Do.
Chatham Island.	E. of Wreck Bay	32			Jan. 21, 1934	170	do	2 y		69328	Do.

TABLE 74.—*Material examined of* Cycloës bairdii—Continued

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Depth	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″	*Fathoms*								
Atlantic coast of America	*Latitude N.*										
NORTH CAROLINA: 25 mi. ESE. Lookout Lightship.	Gulf stream					July 28, 1915		*Fish Hawk*	1 ♂ y	50500	
FLORIDA: Off Miami	Gulf stream		75			1915		J. B. Henderson.	1 ♂	68503	
			Feet								
Off Biscayne Bay.			16–34			May 29, 1912		Paul Bartsch	2 y	68528	
Key West						1934		H. H. Darby	1 ♀	71065	Gift of Carnegie Institution.
			Fathoms								
Pourtales Plateau.	10 mi. S. of Key West		125	rky. Co				J. B. Henderson.	1 ♀ 1 y	68504	
Tortugas	Abt. 9 mi. S. of SW. Channel buoy.		20	Crs. S		Aug. 16, 1924		*Dohrn*, boat dredge.	1 ♂	66432	Do.
Do						1924		H. B. Bender.	1 ♂	66428	Do.
Do	Outer Lighthouse Reef.					June 7, 1925		W. L. Schmitt.	1 ♂	66434	From fish stomach #129, gray snapper, *Neomaenis griseus* (L).
Do	Across channel, E. of Loggerhead Key.		8–5 at end of haul.	rky. with *Gracillaria*.		June 11, 1925	213	do	1 y	66431	Do.
Do	About 7 mi. S. of No. 2 red buoy.		20	crs. gy. S		do	216	do	1 ♀ 1 y	66429 66430	Do.
			Feet								
Do	3 mi. N. of Loggerhead Key, on shoals.		10–45			June 17, 1925		Taylor and Dexter Thompson.	1 ♂	66427	Do.
Do	¼ mi. S. of Bird Key Harbor.					June 21, 1925		W. L. Schmitt.	1 ♂ 1 ♀	66433	From fish stomach #499, gray snapper, *Neomaenis griseus* (L).
Do			66–60			Aug. 5, 1932	73	do	1 juv	71372	Do.
Do								J. B. Henderson.	1 y	68529	

W. of Cape Romano.	26 04 00	82 49 00	21½	S. brk. Sh.	66	Mar. 17, 1889	5099	*Grampus*	1 ♂	15287	
Off Charlotte Harbor.	26 33 00	83 10 00	28	sdy	66	Apr. 2, 1901	7123	*Fish Hawk*	1 ♂	25603	
BAHAMAS: Spanish Wells.			6			July 12, 1903		State Univ. Iowa Bahama Exped.	1 ♀	S. U. I.	
CUBA: Reef Lavesos Italicnos.	Opp. Cayo Lavesos		2-3	Co. S. R.		June 2, 1914		Henderson and Bartsch.	1 ♀	48562	*Tomas Barrera* Exped.
PUERTO RICO: Ponce						Jan. 30, 1899		*Fish Hawk*	1 ♂ 1 ♀	24078	
ST. THOMAS									1	Copenhagen Mus.	
ANTIGUA: English Harbor.						1918		State Univ. Iowa Barbados-Antigua Exped.	1 ♀	S. U. I.	
BARBADOS: Pelican Island.			38			May 13, 1918	1	do	1 y	57993	
CARIBBEAN SEA: Old Providence Island.						Apr. 4-9, 1884		*Albatross*	1 ♂	18541	

Subfamily MATUTINAE ALCOCK

Matutidae DANA, United States Exploring Expedition, Crustacea, pt. 1, p. 394, 1852; pt. 2, p. 1427, 1853.

Matutinae ALCOCK, Journ. Asiatic Soc. Bengal, vol. 65, p. 139, 1896.

Merus of external maxillipeds elongate and acute, entirely concealing the palp in repose. Legs natatorial. (Alcock).

Genus HEPATUS Latreille

Hepatus LATREILLE, Histoire naturelle . . . des Crustacés, vol. 3, p. 22, 1802 [type, *H. princeps* (Herbst) = *H. angustata* Fabricius].

Hepathus LAMARCK, Histoire naturelle des animaux sans vertèbres, vol. 5, p. 267, 1818 (type *H. calappoides* Lamarck).

Hepatulus [24] FOWLER, Ann. Rept. New Jersey State Mus., 1911, p. 590, 1912 (type, *H. fasciatus* Latreille).

Carapace broad, convex, regularly arcuate in front, strongly narrowing behind; hepatic regions very large, branchial regions very small. Front narrow, straight or nearly so, rather prominent, and situated above the level of the lateral border of carapace, which is prolonged beneath the orbits to join the margin of buccal cavity. Orbits small, circular, on a level with front. Antennulae very oblique. Antennae at inner angle of orbit. Buccal cavity very narrow forward and triangular, extending as far as level of lower border of orbits and entirely covered by outer maxillipeds, of which the merus is triangular and has straight inner margin, under which are concealed the following segments. Chelipeds strong, and when flexed fit closely against lower surface of body. Hands with a superior crest, fingers inclined a little downward and inward. Ambulatory legs smooth, unarmed.

Georgia to Brazil; west and south Africa; East Indies; west Mexico to Chile.

KEY TO THE SPECIES OF THE GENUS HEPATUS

A[1]. Sixth segment of male abdomen smooth.
- B[1]. Front advanced beyond line of suborbital cavities.[25]
  - C[1]. Carapace covered with small spots. Front bidentate..**princeps** (p. 235)
  - C[2]. Carapace covered with large spots. Front truncate..**epheliticus** (p. 238)
- B[2]. Front not advanced beyond line of suborbital cavities. Carapace covered with narrow arcuate stripes of color. Two large tubercles on fourth abdominal segment of male..**kossmanni** (p. 239)

A[2]. Sixth segment of male abdomen not entirely smooth.
- B[1]. Front scarcely advanced beyond line of suborbital cavities. No teeth on posterior margin. Sixth segment of male abdomen with a median terminal tubercle.....**chiliensis** (p. 244)
- B[2]. Front advanced; suborbital cavities not visible from above. A prominent tooth near either end of posterolateral margin. Segments 1–6 of male abdomen tuberculate..**lineatus** (p. 246)

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[24] Substituted for *Hepatus* Latreille, 1802, a name preoccupied by Gronow, 1763, for a genus of fishes. In 1925 Gronow's name was rejected by the International Commission on Zoological Nomenclature (Smithsonian Misc. Coll., vol. 73, no. 3, opinion 89).

[25] In pl. 70, fig. 1, the carapace of *H. princeps* is tipped backward.

ANALOGOUS SPECIES OF HEPATUS ON OPPOSITE SIDES OF THE CONTINENT

ATLANTIC	PACIFIC
princeps.	*kossmanni.*

HEPATUS PRINCEPS *(Herbst)*

PLATE 70, FIGURES 1, 2

? *Cancer thorace latiusculo convexo laevi, undique emarginato crenato, postice contractiore peded non contegente; manibus cristalis* GRONOVIUS, Zoophylacium, vol. 2, no. 960, p. 223, 1764 (type locality, Martinique; type not located).

? *Cancer pudibundus* HERBST, Versuch einer Naturgeschichte der Krabben und Krebse, vol. 1, p. 199, 1785; after Gronovius.

Cancer princeps HERBST, Versuch einer Naturgeschichte der Krabben und Krebse, vol. 2, p. 154, pl. 38, fig. 2, 1794 (type locality, "Ostindien"; type not extant).

Calappa angustata FABRICIUS, Supplementum entomologiae systematicae, p. 347, 1798 (type locality, American Ocean; type not extant).

Hepatus fasciatus LATREILLE, Histoire naturelle . . . des Crustacés, vol. 5, p. 388, 1803 (type locality, American Ocean; type not extant).

Hepathus calappoides LAMARCK, Histoire naturelle des animaux sans vertèbres, vol. 5, p. 268, 1818 (type locality, Antilles; type not located).

Hepatus angustatus DANA, U. S. Exploring Expedition, Crustacea, p. 394, pl. 25, fig. 2, 1852.—HELLER, Reise der österreichischen Fregatte *Novara*, p. 69, 1865.

Hepatus tuberculatus SAUSSURE, Mém. Soc. Phys. Nat. Hist. Genève, vol. 14, p. 451 [35], pl. 2, figs. 9, 9a, 1858 (type locality, Guadeloupe; type in Geneva Mus.).

Hepatus princeps VON MARTENS, Arch. für Naturg., vol. 38, pt. 1, p. 112, 1872. RATHBUN, Bull. U. S. Fish Comm. for 1900, vol. 20, pt. 2, p. 86, 1901.

Diagnosis.—Carapace covered with transverse lines or small spots. Front bidentate, definitely advanced beyond the line of the suborbital cavities; lower margin of cavities slightly arcuate. Last three segments of abdomen smooth.

Description.—Anterior margin of front thick, obtuse, slightly bidentate. The line descending obliquely from the external orbital angle to anterior border of carapace is marked with a few granules chiefly on the lower half. Anterolateral margins divided into 12 or 13 teeth more or less rectangular, denticulate on their margins and not projecting. About 8 transverse rows of granules on dorsum. Outer face of hands with five rows of tubercles, exclusive of the marginal ones. Dactyli with a coating of fur, except for a narrow, smooth line on either side.

Color.—Pale yellowish brown, with dark brown transverse lines, or transverse series of spots; legs subochreous, with one or two large purplish blotches in each joint. (Dana.)

Measurements.—Male (24068), length of carapace 58, width 84 mm.

Range.—Georgia to Brazil; west Africa; Cape of Good Hope (Herklots); East Indies (Herbst).

Material examined.—See table 75, pages 236.

TABLE 75.—*Material examined of* Hepatus princeps

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
CUBA:	° ′ –	° ′ –									
Ensenada de Cajon, off Cape San Antonio.						May 22, 1914	295	Henderson & Bartsch.	1 ♂1 ♀	48556	*Tomas Barrera* Exped.
Los Arroyos						May 20, 1914	8(213)	do	1 ♂	48411	
Cienfuegos						Mar. 6, 1860		Joseph Aviles	1 ♀	1045, M. C. Z.	
Cuba								Palmer & Riley	2 ♀	23837	
JAMAICA								J. E. Duerden		Inst. Jamaica	Fairly common.
Kingston Harbor						1893		R. P. Bigelow	1 ♂	17984	
Do						May 31, 1927		C. R. Orcutt	1 ♂; 1 cheliped	66420	
Harbor Head, Kingston.								do	3 ♂ 2 ♀	66421	
Hope Bay								do	1 cheliped	68143	
The Palisades								do	1 ♂	81131	
HAITI:											
Gonaives						1859		E. Habich	3 ♂	696, M. C. Z.	
Jeremie						1858		Dr. D. F. Weinland.	1 ♂	722, M. C. Z.	
PUERTO RICO:											
Puerto Real				Coral reef		Jan. 27, 1899		Fish Hawk	1 ♂1 ♀	24068	
San Juan Harbor				Fish trap		Jan. 13, 1899		do	1 ♂1 ♀; 1 ♂	24067; 46248	
ST. THOMAS								*Hassler*	2 ♂	6420, M. C. Z.	
ST. JOHN									1	Copenhagen Mus.	
GUADELOUPE									1 ♂	Geneva Mus.	Holotype.
PANAMA:											
Toro Point, Canal						May 19, 1911		Meek & Hildebrand.	1 ♂	43995	Smithsonian Biol. Survey.
Do						Jan. 25, 1912		do	2 ♂1 ♀	59305	Do.
BRAZIL:	*Latitude S.*										
Plataforma, Bahia						1875–'77		R. Rathbun	1 ♂1 ♀	40582	Hartt Explorations.
Rio de Janeiro									1	Copenhagen Mus.	
Do								*Hassler*	7 ♂ ♀	6421, M. C. Z.	
Do						1865		do	4 ♂ 2 ♀	6422, M. C. Z.	
Paqueta, Bay of Rio de Janeiro.						Aug. 19, 1925		W. L. Schmitt	2 ♂ 3 ♀	61612	Walter Rathbone Bacon Scholarship.

Ilha São Sebastião, São Paulo.						1906		F. Gunther	1 ♀	47848	From H. von Ihering.
Do								H. Luederwaldt	2 ♂ 3 ♀	66608	
S. of Villa Bella, Ilha São Sebastião.						Sept. 19, 1925	15	W. L. Schmitt	1 ♀	66417	Walter Rathbone Bacon Scholarship.
Do						Sept. 23, 1925		do	1 carapace	61774	Do.
Do			Beach			Sept. 24, 1925		do	1 y	66418	Do.
	Latitude N.										
WEST AFRICA: Guinea									1	Copenhagen Mus.	

HEPATUS EPHELITICUS (Linnaeus)

CALICO CRAB; DOLLY VARDEN CRAB

PLATE 70, FIGURES 3, 4; PLATE 71, FIGURES 1–4

Cancer epheliticus LINNAEUS, Amoenitates academicae, etc., vol. 6, p. 414, 1763 (type locality, Carolina; type not located).

Cancer floridus LINNAEUS, Systema naturae, ed. 12, vol. 1, pt. 2, p. 1041, 1767 (type localities, Carolina and Asia; types not located); not Rumphius, D'Amboinische Rariteitkamer, pl. 8, fig. 5, 1705.

Cancer decorus HERBST, Versuch einer Naturgeschichte der Krabben und Krebse, vol. 2, p. 154, pl .37, fig. 6, 1794 (type locality not given; type in Berlin Mus.); vol. 3, pt. 3, p. 6, 1803.

Hepatus decorus GIBBES, Proc. 3d Meet. Amer. Assoc. Adv. Sci., p. 183 [19], 1850.—VON MARTENS, Arch. für Naturg., vol. 38, pt. 1, p. 113, 1872.

Hepatus vanbenedenii HERKLOTS, Bijdr. Dierk. Soc.-Zool. Roy. Nat. Art. Mag. Amsterdam, vol. 5, p. 36, pl., fig. 1–1c. 1852 (type locality, America; type in Mus. Louvain).

Hepatus epheliticus HAY and SHORE, Bull. U. S. Bur. Fish., vol. 35, p. 422, pl. 32, fig. 1, 1918.

Diagnosis.—Carapace covered with large spots. Front advanced beyond the line of the suborbital cavities; lower margin of cavities semicircular. Last 3 segments of abdomen smooth.

Description.—Front truncate, not dentate. The line descending obliquely from external orbital angle to anterior border of carapace is marked by one or two granules. Carapace dorsally almost smooth, indistinct lines of low granules on gastric region and on posterior part of branchial region. Marginal denticles of carapace more prominent than in *princeps*, the middle denticle of each anterolateral tooth projecting; the shallow tooth near hinder end of postero-lateral margin is also more advanced. Chelae and dactyls of legs similar to those of *princeps*.

Color.—Carapace covered with many large, irregular spots of pale blood-red, each with a rim of darker shade; ground yellowish white or brownish. In the young the carapace may have a combination of spots and transverse bands of color.

Measurements.—Male (8782), length of carapace 46, width 67.3 mm. Female (Herklots), length 51, width 73 mm.

Range.—Chesapeake Bay to Texas and Cuba; 2 to 25 fathoms.

Material examined.—See table 76, page 240.

HEPATUS KOSSMANNI Neumann

PLATE 72, FIGURES 3, 4

Hepatus kosmanni[26] NEUMANN, Catalog der Podophthalmen Crustaceen des Heidelberger Museums, p. 28, 1878 (type locality, west coast of America; type in Heidelberg Mus.).

Hepatus kossmanni RATHBUN, Proc. U. S. Nat. Mus., vol. 38, p. 593, 1910 (part; Panama Bay only); Proc. California Acad. Sci., ser. 4, vol. 13, p. 374, 1924.

Diagnosis.—Carapace covered with narrow stripes of reddish color parallel to the arcuate anterolateral margin. Front not advanced beyond the line of the suborbital cavities. Upper margin of cavities forming not an angle, but a regular curve with the anterolateral margin. Two large tubercles on fourth abdominal segment of male.

Description.—Similar in shape to *H. princeps*, but carapace a little narrower and more strongly arched. Front truncate, not dentate and not projecting beyond the suborbital area, which is lower and wider than in *princeps* and its upper border prominently granulate forming no angle with the lateral margin of carapace, as in *princeps*. Anterolateral margin finely denticulate, the denticles not formed into teeth except at the posterior ends of the margin. Punctae of dorsal surface visible to naked eye; eight clusters of tubercles, three gastric, one cardiac, and two on each branchial region, the anterior one elongate and arcuate.

The male abdomen has on the fourth segment two large smooth, prominent tubercles, which occupy almost the entire width; the sixth segment tapers more gradually than in *princeps*. The manus has three subrectangular teeth on upper margin separated by closed fissures; in *princeps* these teeth are triangular. The lower margin of the chela is more sinuous and the fixed finger more deflexed than in the allied species.

Color.—Narrow reddish stripes are parallel to the arcuate anterolateral margin.

Measurements.—Male (40712), length of carapace 50, width 70, greatest height of body 30 mm.

Range.—West coast of Mexico to Ecuador; 2 to 25 fathoms.

Material examined.—See table 77, page 243.

[26] Named for R. Kossmann.

TABLE 76.—*Material examined of* Hepatus epheliticus

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″			°F.						
CHESAPEAKE BAY						1880		Earll and McDonald.	1 ♂	5164	U. S. Fish Commission.
NORTH CAROLINA:											
Off Cape Hatteras.	35 25 30	75 20 30	15	gy. S. brk. Sh		Oct. 20, 1884	2291	*Albatross*	1 y	50974	
Do	35 21 30	75 25 00	11	crs. gy. S		Oct. 19, 1884	2286	do	2 ♂ 1 ♀	7239	
Do	35 21 25	75 24 25	13	crs. gy. S		do	2285	do	3 ♂ 3 ♀ 1 y	8783	
Do	35 21 15	75 23 15	14	gy. S		do	2283	do	2 ♂ 1 ♀	8784	
									1 ♀	45712	
Do	35 21 20	75 23 50	13	crs. gy. S		do	2284	do	1 ♂	8787	
Do	35 21 10	75 22 40	14	bk. S		do	2282	do	1 ♂	8782	
Wrightsville Beach.						Mar. 26, 1915		R. W. Leiby	1 ♀	49112	From N. C. State Dept. Agr.
Off Cape Fear	33 49 30 to 33 51 00	78 03 00 / 78 04 45	6–7		80.5–81	July 13, 1915	8278–8280	*Fish Hawk*	1 ♂	58368	
Do	33 48 15	77 59 15	3½	M. S	73	Sept. 24, 1913	7980	do	1	51097	
SOUTH CAROLINA:											
Myrtle Beach						1923		James Henry Rice, Jr.	1 carapace		
Charleston market.						1881		C. C. Leslie	1 ♀	4090	
Charleston						1852		L. Agassiz	2 ♂ 2 ♀	706, M. C. Z.	
Do								T. Lyman	3 y	6423, M. C. Z.	
Blackfish Bank, off Charleston.						Mar. 8, 1880		R. E. Earll	1 ♂ 1 ♀	5165	
Folly Island						Feb. 3, 1934		G. R. Lunz, Jr.	1 ♂ y	Charleston Mus.	
Sullivans Island						March, 1934		G. R. Lunz, Jr., and S. P. de Veaux, III.	1 ♀ y	do	
Off S. end of May River.			10	hrd	51	Jan. 16, 1891	1651	*Fish Hawk*	1 ♂	18197	
FLORIDA:											
Fernandina						May 8, 1929		T. Van Hyning	1 ♂ y	66451	
Do						Dec. 5, 1919		*Albatross*	1 ♂	68526	
Do				Shrimp trawl		Dec. 6, 1919		do	3 ♂ 2 ♀	68525	2 with actinians.
Do				Sandy beach along the Atlantic.		Mar. 29, 1932		F. M. Uhler and A. L. Nelson.	1 ♀, 4 carapaces.	66469	Biol. Surv., Dept. Agric. Dead.

Anastasia Island	South Beach.							Reddington and Lee.	1 ♂	25190	Obtained more than 200 in 3 days.
Melbourne								R. E. Osborn	1 ♀	18199, S. U. I.	
Biscayne Bay, Miami.						Apr. 30, 1930		Edward J. Brown.	1 ♂	64912	
Inside Sombrero								Wm. Stimpson	1 ♂	6319, M. C. Z.	
South Florida						1879		Silas Stearns	2 ♀	3479	
Key West						1861		Dr. Holder	1 ♂	6624, M. C. Z.	
Tortugas	Channel between White Shoal and Loggerhead Key.					June 21, 1931	6	W. L. Schmitt	1 carapace	66454	Gift of Carnegie Institution.
Do			4					J. B. Henderson.	1 y	68511	
					°C.						
Off Cape Sable	25 03 30	81 12 10	2¾		22	Dec. 18, 1902	7366	*Fish Hawk*	1 y	68513	
Do	25 06 45	81 19 07	3	gy. S. brk. Sh	22½	do	7358	do	1 ♀ y	68524	
Caxambas						1919		George Mott	1	53401	
Oyster Bay								H. Hemphill	1 ♂	14946	
Marco								do	1 ♂ 2 ♀ 9 y	14945	
Sanibel Island						Feb. 22, 1928		O. C. Van Hyning.	1 ♂ 3 ♀	Florida State Mus.	
Sanibel Beach								W. F. Clapp	4 y		
Sanibel Island	Bell buoy off Light, NE. 10—2½ miles.		4¾	Sh. wh. M		Jan. 1, 1913	7795	*Fish Hawk*	1 ♂ 1 ♀ 3 y	50993	
Captive Key, Charlotte Harbor.						1858-9		G. Wurdemann	1 ♂	714, M. C. Z.	
Punta Rasa						Feb. 1884		H. Hemphill	1 y	6666	
Gasparilla Light	SE. by E. 6½ mi		4	hrd. S. brk. Sh		Jan. 4, 1913	7800	*Fish Hawk*	1 y	50994	
Do	E. by S. 6¼ mi		7	hrd. S. brk. Sh		do	7799	do	3 y	50995	
St. Petersburg						Aug. 24, 1915 Apr. 13, 1916		J. B. Clark	1 ♀ 1 ♂	57844	From Florida State Mus.
Cedar Keys			2			1884		H. Hemphill	4 y	9382	
West Florida								Henderson and Simpson.	1	17799	
Florida								Wurdemann, Steele, Dorman.	15	2053	
Do								G. M. Gray	1 ♀	42136	
Do								G. Wurdemann	5 ♂ y	1172, M. C. Z.	
Do								do	2 ♀	1362, M. C. Z.	
LOUISIANA:											
Off Breton Island.						Nov. 1930		Stewart Springer	1 ♀	64154	From Caribbean Biol. Laboratories.
Grand Isle						Summer, 1930.		Wm. W. Anderson.	3 ♂ 1 ♀	66445	
TEXAS:											
Galveston								M. A. Davey	1 ♂ 1 ♀	18904	
Corpus Christi								Mrs. Mary E. Quisenberry.	1	63276	
Texas								C. L. Gwyn	1 ♀	18744	

TABLE 76.—*Material examined of* Hepatus epheliticus—Continued

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
MEXICO: Gulf of Campeachy.	19 40 00	92 30 00	25	M.		July 15, 1932		Warren Fish Co., Pensacola.	1 ♀	66439	Taken in fish traps. From U. S. Bureau of Fisheries.
CUBA								Berlin Museum	1	Berlin Mus.	
DOMINICAN REPUBLIC: Boca del Infierno, Samana Bay.						Feb. 1928		Gerrit S. Miller, Jr.	3 y	68419	2 with anemone.
JAMAICA								C. R. Orcutt	1 cheliped	68144	
LOCALITY UNKNOWN								Berlin Museum	1	Berlin Mus.	36.7 mm wide.

TABLE 77.—*Material examined of* Hepatus kossmanni

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
MEXICO:	° ′ ″	° ′ ″									
Abreojos Point						July 31, 1922		G. D. Hanna	1 ♂	Cal. Acad. Sci.	
15 mi. S. by W. of mouth of Bayona River, Boca de Teacapan, Sinaloa.	22 34 00	105 53 00	10	M		July 28, 1932	T. 5, R.	*Zaca*, Crocker Exped.	1 ♂ 2 ♀	do	2 anemones on ♀.
E. of Isabel Island	22 01 00	105 50 00	25	M		do	T. 4, R.	do	1 ♂ 1 ♀	do	1 anemone on ♀.
COSTA RICA:											
Puerto Culebra	In bay		10			Feb. 24, 1934	253	*Velero III*	1 y	69217	Hancock Galapagos Exped.
Do	Cocos Bay		2–4			Mar. 13, 1933	116	do	5 y	68002	Do.
PANAMA:											
Bay of Panama	8 51 00	79 31 30	7	gn. M		Mar. 30, 1888	2800	*Albatross*	4 ♀ 1 ♀	22129 6370, M. C. Z.	
Do	8 47 00	79 29 30	14	gn. M		do	2801	do	1 ♂	22130	
Do	8 38 00	79 31 30	16	gn. M		do	2802	do	5 ♂	40712	
Taboga Island								E. D. Robson	1 ♀	69404	
Panama								H. A. Ward	2 ♂	18291	
COLOMBIA:											
Cabita Bay, Cape Corrientes.	Near point		10			Feb. 13, 1934	231	*Velero III*	1 y	69219	Hancock Galapagos Exped.
Gorgona Island	Near Gorgonilla Channel.		15	M		Feb. 12, 1934	228	do	1 y	69218	Do.
ECUADOR:											
Cape San Francisco	Off river mouth		2	M., debris		Feb. 11, 1934	215	do	1 ♂ soft shell 2 y	69216	Do.
Do			20	Muck		do	216	do	1 ♀ y	69410	Do.
La Libertad	*Latitude S.* Between La Libertad and Salinas.		7–8			Feb. 9, 1934	208	do	2 y	69220	Do.

HEPATUS CHILIENSIS Milne Edwards

PLATE 72, FIGURES 1, 2; PLATE 73, FIGURES 1-5

Hepatus chiliensis MILNE EDWARDS, Histoire naturelle des Crustacés, vol. 2, p. 117, 1837 (type locality, Valparaiso; type in Paris Mus.).—RATHBUN, Proc. U. S. Nat. Mus., vol. 38, p. 551, pl. 37, fig. 1, 1910.—PORTER, Rev. Chil. Hist. Nat., vol. 25, p. 424, fig. 36, 1921.

Hepatus chilensis MILNE EDWARDS and LUCAS, *in* d'Orbigny's Voyage dans l'Amérique méridionale, vol. 6, pt. 1, p. 28, 1843; vol. 9, atlas, pl. 14, 1847.—DANA, U. S. Exploring Expedition, Crustacea, p. 395, pl. 25, fig. 3, 1852.—HELLER, Reise der österreichischen Fregatte *Novara*, p. 70, 1865.—MIERS, Proc. Zool. Soc. London, 1877, p. 656.

Hepatus angustata KINAHAN, Journ. Roy. Soc. Dublin, vol. 1, p. 345, 1857 (1858); not *Calappa angustata* Fabricius, 1798.

Hepatus angustatus ORTMANN, Zool. Jahrb., vol. 6, p. 569, 1892 (part; not *H. decorus*).—LENZ, Zool. Jahrb., vol. 2, suppl. 5, p. 751, 1902.

Diagnosis.—Front truncate, scarcely or not at all advanced beyond line of suborbital cavities. Posterior and postlateral margins marked by elongate tubercles and devoid of teeth. Sixth segment of male abdomen with a median terminal tubercle.

Description.—Anterior margin of front truncate, subacute. The line descending from the external orbital angle to the anterior border of the carapace is finely granulous and continuous with the anterolateral arch. The anterior two-thirds of this arch is regularly denticulate, the denticles not tooth forming in the old but separated by faint suture lines into groups of three or four; in younger specimens these groups or lobes are defined by V notches, especially at the widest part of the arch. One adult male from Iquique is an exception, preserving the well-marked lobes of the immature. Suborbital cavities broad and low. Of the eight dorsal lines of tubercles, those on branchial and cardiac regions are arcuate. Upper margin of palm with four low dentiform projections, tips blunt. Dactyli of ambulatories with a strip of fur above and below, not extending to proximal end, sides mostly bare.

Color.—Carapace a yellowish or ochreous base closely covered with a brownish purple reticulation. (Dana.) Nearly uniform pink, with narrow sinuated light yellow spots and lines. (Miers.)

Measurements.—Male (40453), length of carapace 56.5, with 84 mm.

Range.—Ecuador to Chile; 2½ to 23 fathoms.

Material examined.—See table 78, page 245.

TABLE 78.—*Material examined of* Hepatus chiliensis

Locality	Bearings: Latitude S.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″									
PERU:											
Paita						1873		Dr. W. H. Jones, U. S. N.	1 ♀	6419, M. C. Z.	
Callao								*Hassler*	1 ♀	6418, M. C. Z.	
Do						Apr. 29, 1907		R. E. Coker	2 ♂	40452	From Peruvian Government.
Do								Sander	1 ♂	19564	From Berlin Museum.
Do									1	Copenhagen Mus.	
Near NE. side of San Lorenzo Island.			2½			Feb. 5, 1907		R. E. Coker	1 ♂	40453	From Peruvian Government.
Off San Lorenzo Island						Nov. 7, 1926		W. L. Schmitt	1 ♂ 3 ♀	66446	Walter Rathbone Bacon Scholarship.
San Lorenzo						1877		Comte de Serres	1 ♂ 1 ♀	20318	From Paris Museum.
Paraca Bay								*Hassler*	1 ♂ 2 ♀	6416, M. C. Z.	
Independencia Bay								R. C. Murphy	1 ♀	Brooklyn Mus.	
Mollendo			20–23			Sept. 1883		Dr. W. H. Jones, U. S. N.	1 ♂ 1 ♀ 1 ♂	6577 46275	Taken with hook and line.
Peru								W. E. Curtis	4	14846	
CHILE:											
Cavancha Iquique								Plate collection	1 ♂	10500 *Berlin Mus.*	
Mejillones						Oct. 27, 1862		Capt. W. H. A. Putnam.	3 ♀	6417, M. C. Z.	
Caldera								*Hassler*	6 ♂ 5 ♀	6414, M. C. Z.	
Valparaiso								do	1 ♂	6413, M. C. Z.	
Do						1838–1842		J. D. Dana, U. S. Expl. Exped.	12 ♂ ♀	2387	
Do								Edwyn Reed	1 ♀	66453	
Guajancan								Plate collection	1 y	10501 Berlin Mus.	
Juan Fernandez								*Hassler*	1 ♀	6415, M. C. Z.	
Chile								H. Rolle	1 ♀	66442	From Mus. Paulista.

HEPATUS LINEATUS Rathbun

FIGURE 44; PLATE 74, FIGURES 1, 2; PLATE 75, FIGURES 1, 2

?Hepatus sp. KINAHAN, Journ. Roy. Soc. Dublin, vol. 1, pp. 333, 345, 1857 (1858) (Chincha Islands, Peru).

Hepatus lineatus RATHBUN, Proc. U. S. Nat. Mus., vol. 21, p. 610, pl. 44, fig. 4, 1898 (type locality, off Abreojos Point, Lower California; type, U. S. N. M. no. 21597).

Diagnosis.—Carapace narrow and high; suborbital cavities not visible from above; front advanced, thick, truncate; first to sixth segments of male abdomen tuberculate. A longitudinal stridulating ridge on inner face of movable finger.

Description.—Carapace strongly arched, height about one-third width. Front well advanced beyond outer orbital angles and having

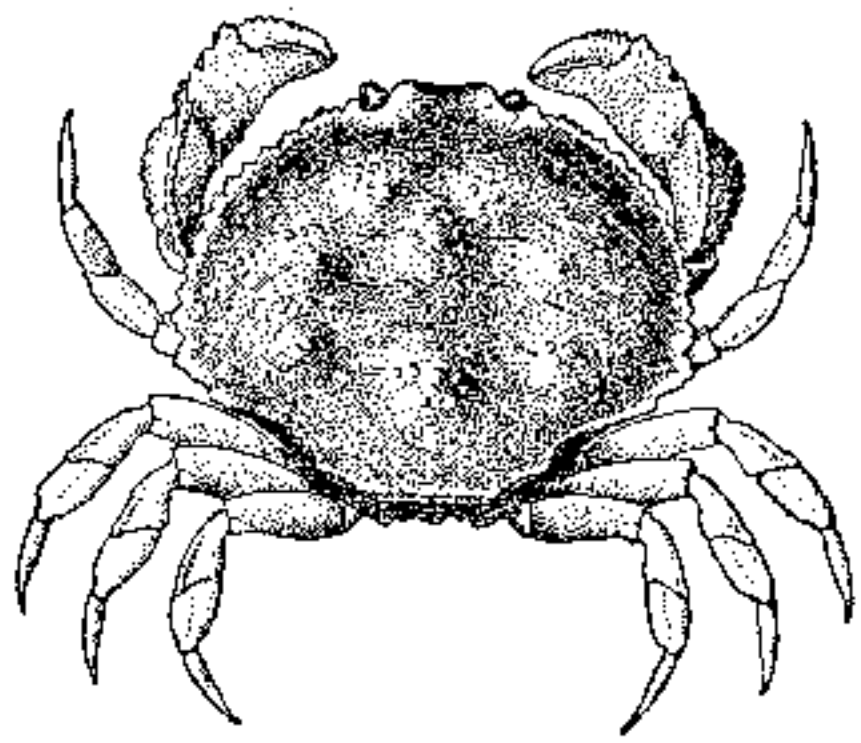


FIGURE 44.—*Hepatus lineatus*, male (21597): Dorsal view.

a broad median furrow with a dorsal swelling on either side. The clusters of tubercles on the dorsum consist of a single large tubercle surrounded by a number of small ones; in front of the anterior branchial cluster there is a line of 11 to 14 tubercles extending obliquely backward and outward. The tridenticulate teeth of the anterolateral margin increase gradually in size beginning at the orbit. Posterolateral margin very concave, anteriorly thickened and bearing a prominent tooth near either end. Abdomen narrow, tuberculate except terminal segment; sternum closely tuberculate. Tubercles of manus very large and close, superior teeth four, triangular. Dactyli of legs pilose.

Color.—Red lines encircle round or oblong areas which touch one another, or the lines border narrow strips forming transversely arcuate bands across carapace except behind, where the patches are more irregular.

Measurements.—Male cotype, length of carapace 17.6, width 22 mm.

Habitat.—The carapaces of quite a number of these crabs were found at the lowest tide levels in the sandy portions of the beach at San Felipe. Living crabs are usually decorated with one or a number of solid, purple and white striped anemones of the family Sagartiidae,

which no doubt act as a partial protection from their enemies. By removing a large *Murex* from the sand a few of these crabs were located underneath it at a depth of 4 inches. (S. A. Glassell.)

Range.—Mexico; ?Peru.

Material examined.—Mexico:

Off Abreojos Point, Lower California; lat. 26°42′30″ N., long. 113°34′15″ W.; 5½ fathoms; gn. M.; May 4, 1888; station 2835; *Albatross*; 2 males, cotypes (21597).

Magdalena Bay; 1917; C. R. Orcutt; 1 male (50653).

San Felipe, Gulf of California; low tide, buried in sand; May 8, 1933; E. H. Quayle collector; 1 immature female (Glassell collection).

San Felipe; May 6–15, 1933; H. N. Lowe; 1 male, 1 female (67730).

Genus HEPATELLA Smith

Hepatella Smith, *in* Verrill, Amer. Nat., vol. 3, p. 250, 1869 (type, *H. amica* Smith).

Allied to *Hepatus*. Carapace subrectangular, facial region prominent, eyes very small, with short peduncles. No depression below orbit. Lateral regions concave above. Chelipeds similar to those of *Hepatus*. Ambulatory legs cristate above and below on merus, carpus and propodus.

West coast of Mexico to Peru.

KEY TO THE SPECIES OF THE GENUS HEPATELLA

A.[1] Carapace more than one-third wider than long. Margin of front thick between and outside the orbits. Lateral teeth irregular, subacute ..... **amica** (p. 247)

A.[2] Carapace one-tenth wider than long. Margin of front thin between and outside the orbits. Lateral teeth even, subtruncate ..... **peruviana** (p. 248)

HEPATELLA AMICA Smith

Plate 76, Figures 1, 2

Hepatella amica Smith, *in* Verrill, Amer. Nat., vol. 3, p. 250, footnote, 1869 (type locality, Panama; type in Peabody Mus., Yale Univ.).

Description.—Carapace broad; gastric and posterior branchial regions protuberant and granulous, as is also the middle of the cardiac region; rest of carapace smooth. Lateral margins nearly parallel posteriorly, the edge thin and armed with about 12 irregular, sharp teeth; it forms an obtuse angle with the hepatic margin which is very thick. Upper margin of palms with three low, subtruncate teeth. Sternum deeply punctate and vermiculate. Male abdomen very narrow, acutely pointed, the third, fourth, and fifth segments fused.

Measurements.—Male holotype, length of carapace 11.5, width 15.8 mm. Male (59343), length of carapace 20, width 29 mm.

Range.—Mexico to Ecuador.

Material examined.—See table 79, page 249.

HEPATELLA PERUVIANA Rathbun

Hepatella amica RATHBUN, not Smith, Proc. U. S. Nat. Mus., vol. 38, p. 552, pl. 50, fig. 5, 1910.

Hepatella peruviana RATHBUN, Proc. Biol. Soc. Washington, vol. 46, p. 183, 1933 (type locality, Bay of Sechura, Peru; U.S.N.M. no. 40451).

Description.—Carapace narrow, edge thin, front more produced and orbits more dorsal than in *amica*. Protuberances small, one oblong and granulate on each branchial region; one round on cardiac region and crossed by a transverse line of granules; three small, granulate, on gastric region, the median behind the lateral pair. Anterolateral teeth regular, subtruncate; a broad tooth near anterior end of posterolateral margin, a thicker, more prominent tooth at end of posterior margin.

Measurements.—Female holotype (40451), length of carapace 18.2, width 20 mm.

Range.—Panama to Peru.

Material examined.—See table 80, page 249.

Genus OSACHILA Stimpson

Osachila STIMPSON, Bull. Mus. Comp. Zool., vol. 2, p. 154, 1871 (type, *O. tuberosa* Stimpson).

Near *Hepatus* in all essential characters, but differs in the narrower, octagonal carapace, more or less depressed and expanded at sides; very uneven surface having usually six chief protuberances; and the much produced front, forming a true rostrum.

From North Carolina to northwest Florida and Windward Islands; eastern Atlantic; Cape San Lucas to Panama; Hawaiian Islands; 13 to 164 fathoms.

KEY TO THE AMERICAN SPECIES OF THE GENUS OSACHILA

A¹. Length of carapace more than three-fourths of its width.
- B¹. Rostrum thick, bilobed.
  - C¹. Dorsal surface of carapace wholly eroded.
    - D¹. Cardiac elevation pointed behind ..... **antillensis** (p. 251)
    - D². Cardiac elevation rounded behind ..... **galapagensis** (p. 254)
  - C². Dorsal surface of carapace partly eroded, including elevations. Cardiac elevation rounded behind.
    - D¹. Posterolateral margin thin-edged. Outer surface of manus largely reticulated ..... **tuberosa** (p. 250)
    - D². Posterolateral margin thick.
      - E¹. Dorsal protuberances high, six in number. Outer surface of manus with five rows of tubercles ..... **semilevis** (p. 251)
      - E². Dorsal protuberances more than six. Outer surface of manus with 10 or 12 rows of granules ..... **levis** (p. 254)
- B². Rostrum thin, sharp-edged, denticulate. Outer surface of manus with five longitudinal ridges ..... **acuta** (p. 257)

A². Length of carapace three-fourths of its width. Manus sparingly tuberculate ..... **lata** (p. 257)

TABLE 79.—*Material examined of* Hepatella amica

Locality	Bearings	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
MEXICO:										
Isabel Island	Dredging all around isle.	10-25			Mar. 5, 1934	277	*Velero III*	1 ♂ 3 ♀ (1 ovig.) 1 y.	69210	Hancock Galapagos Exped.
Tenacatita Bay	Off Navidad Head	25-35			Mar. 4, 1934	275	do	1 chela	69208	Do.
Petatlan Bay	S. and W. of White Friars Islands.	25			Mar. 2, 1934	264	do	3 ♂ 1 ♀	69207	Do.
PANAMA:										
Rio de Panama					Mar. 24, 1912		Meek & Hildebrand, Smithsonian Biol. Survey.	1 ♂	59343	Largely encrusted with worm tubes and bryozoans.
Bahia Honda	Outside of isle S. of bay.	15-20			Feb. 22, 1934	249	*Velero III*	2 y	69209	Hancock Galapagos Exped.
Secas Islands	S. and W. of group	15	Nullipores		do	251	do	1 ♂	69751	Do.
Panama								1 ♂	Peabody Mus. Yale Univ.	Holotype.
ECUADOR: Cape San Francisco.	Dredging near rocks	2	M. R.		Feb. 11, 1934	214	*Velero III*	1 y	69752	Hancock Galapagos Exped.

TABLE 80.—*Material examined of* Hepatella peruviana

Locality	Bearings	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
PANAMA:										
Secas Islands	S. of group	25	M. dead Sh.		Feb. 22, 1934	250	*Velero III*	2 ♀	69205	Hancock Galapagos Exped.
Changome, Taboga Island	Dredging				Dec. 24, 1933		E. D. Robson	1 ♂ 2 y	69408	
Tortola	Dredged				Nov. 1933		do	1 ♀		Returned to sender.
	Latitude S.									
ECUADOR: La Libertad	N. of Point St. Elena	8-10			Feb. 9, 1934	209	*Velero III*	1 y	69206	Hancock Galapagos Exped.
PERU: Bay of Sechura	W. of Matacaballa	About 5 in trawl.			Apr. 8, 1907		R. E. Coker	1 ovig. ♀	40451	Holotype. Gift of Peruvian Government.

ANALOGOUS SPECIES OF OSACHILA ON OPPOSITE SIDES OF THE CONTINENT

Atlantic	Pacific
antillensis.	*galapagensis.*

OSACHILA TUBEROSA Stimpson

Plate 77, Figure 3

Osachila tuberosa Stimpson, Bull. Mus. Comp. Zool., vol. 2, p. 154, 1871 (type localities, five stations among the Florida reefs, 36–68 fathoms; cotypes not extant).—A. Milne Edwards, Bull. Mus. Comp. Zool., vol. 8, p. 20, 1880 (part; specimen from Sombrero, 54 fathoms).—Rathbun, Bull. Lab. Nat. Hist. State Univ. Iowa, vol. 4, p. 290, 1898 (part; specimen from Station 24); Proc. U. S. Nat. Mus., vol. 50, pp. 647, 649, pl. 36, fig. 3, 1916.—Hay and Shore, Bull. U. S. Bur. Fisheries, vol. 35 (1915–16), p. 423, pl. 31, fig. 10, 1918.—A. Milne Edwards and Bouvier, Mem. Mus. Comp. Zool., vol. 47, p. 304 (part), not pl. 4, fig. 4, 5, 1923.—Boone, Bull. Bingham Oceanogr. Coll., vol. 1, p. 43, 1927 (part; not *antillensis* or *semilevis*).

Diagnosis.—Carapace not eroded all over; posterolateral margin thin-edged, armed with triangular teeth, the first one, which is situated at the lateral angle of the carapace, projected sideways beyond the anterolateral margin; fourth or last tooth prominent, larger than the two preceding. Cardiac region rounded behind. Upper margin of palm tridentate, proximal tooth bifid.

Description.—Six large protuberances on carapace: One mesogastric, one metagastric (paired), one cardiac, one mesobranchial (paired). Protuberances and lateral margins finely eroded, as if worm-eaten. Lobes of front thick, separated by a deep closed or narrow buttonhole fissure. Anterolateral margin (continued toward the buccal cavity) finely dentate. Posterolateral margin with four larger teeth or lobes, including the one at lateral angle. Maxillipeds, sternum and bases of legs below, eroded. Chelipeds eroded; upper margin of manus tridentate, outer surface covered with reticulating ridges and 8 or 9 tubercles. Margins of legs thin, punctate.

Color.—Sand color with reddish cast, white below, claws and legs white. (Henderson.)

Measurements.—Female (8746), length of carapace 18.2, width 20.2 mm.

Range.—North Carolina to Florida; 40 to 65 fathoms.

Material examined.—See table 81, page 252.

OSACHILA SEMILEVIS Rathbun

PLATE 77, FIGURE 1

Osachila semilevis RATHBUN, Proc. U. S. Nat. Mus., vol. 50, p. 652, pl. 36, fig. 1, 1916 (type locality, Gulf of Mexico, 25 fathoms; type, U.S.N.M. no. 17851).—HAY and SHORE, Bull. U. S. Bur. Fisheries, vol. 35 (1915–16), p. 422, pl. 31, fig. 9, 1918.

Diagnosis.—Differs from *O. tuberosa* as follows: Carapace smooth except on elevations; posterolateral margin much shorter than anterolateral; thick, with rounded lobes, the first or lateral lobe projecting sideways equally with the adjacent anterolateral tooth, the last lobe prominent. Elevation between cardiac and mesobranchial elevations absent or insignificant. Outer surface of manus with five rows of tubercles; teeth on upper margin simple.

Measurements.—Female (17851), length of carapace 11.3, width 12.8 mm.

Range.—North Carolina to northwest Florida; 13 to 27 fathoms.

Material examined.—See table 82, page 253.

OSACHILA ANTILLENSIS Rathbun

PLATE 77, FIGURE 2

Osachila antillensis RATHBUN, Proc. U. S. Nat. Mus., vol. 50, p. 650, pl. 36, fig. 2, 1916 (type locality, off Habana, 114 fathoms; type, U.S.N.M. no. 9503).
Osachila tuberosa A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., vol. 47, pl. 4, figs. 4, 5, (part), 1923.

Diagnosis.—Differs from *O. tuberosa* as follows: Carapace eroded all over; posterolateral margin thick, with rounded lobes, the first or lateral lobe not projecting sideways beyond the anterolateral margin. Cardiac region not broadly rounded behind but narrowed and continued backward almost to a point. Proximal tooth on upper margin of manus trifid; outer surface covered with irregular blunt tubercles, reticulating on lower half.

Measurements.—Female holotype (9503), length of carapace 19, width 21.6 mm.

Range.—West Indies; 67 to 164 fathoms.

Material examined.—See table 83, page 255.

TABLE 81.—*Material examined of* Osachila tuberosa

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
	° ′ ″	° ′ ″			°F.						
NORTH CAROLINA:											
Off Cape Hatteras	35 12 30	75 05 00	48	crs. gy. bk. S.	77	Oct. 19, 1884	2269	*Albatross*	1 ♀	8746	
FLORIDA:											
Off Sombrero			54			Apr. 2, 1872	5th cast.	*Bache*; W. Stimpson	1 ♀	2995, M. C. Z.	
SE. of Key West			61					J. B. Henderson	2 ♀	47956	
Off Key West			60			June 19, 1893	24	State Univ. Iowa Exped.	1 ♂ 1 ♀ 2y	69016	
S. by E. from Sand Key Light.			61					J. B. Henderson	1 ♀ ovig	47955	
Sand Key			40			May, 1913		do	1 ♂	46044	
Off Western Dry Rocks.			65					do	1 ♀	68512	
NW. of Tortugas	25 50 15	83 41 30	49	fne. S. brk. Sh.	68	Mar. 11, 1889	5091	*Grampus*	2 ♀ y	15332	
S. of Tortugas			35–40			Summer, 1933		Capt. John W. Mills.	1 ♂	71373	
W. Florida			50					*Bache*; W. Stimpson	1 ♀ y	2994, M. C. Z.	

TABLE 82.—*Material examined of* Osachila semilevis

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collection	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
	° ′ ″	° ′ ″			°F.						
NORTH CAROLINA:											
Fishing grounds, 2 miles N. of Beaufort Harbor.	34 23 00	76 57 30	13	Co. Sh.	81	Sept. 7, 1913	D7959	*Fish Hawk*	1♀	51025	
Fishing grounds off Beaufort Harbor.	34 06 00	77 23 30	14¼	S. Co. Sh.	76	Sept. 23, 1913	D7978	do	1♀	51027	
FLORIDA:											
Tortugas	7 mi. S. of Tortugas		20	crs. gy. S. Sh., few Sponges.		June 11, 1925	216	W. L. Schmitt.	2♀	66449	Gift of Carnegie Institution.
Do	About 6 mi. S. of Tortugas.		18	Red snapper bottom		do	215	do	1♀	66455	Do.
Do	Near Fort Jefferson landing.			Rocks and *Halimeda*		Aug. 17, 1924		do	1♀	66450	Do.
Do	¼ mi. S. of Bird Key Harbor.			In gray snapper fish No. 524.		June 21, 1925		do	1♀	66456	Do.
Off Boca Grande	Boca Grande Lt. N. N.E. ⅜ E. 24½ mi. to N. E. ¼ N. 20 mi.					Jan. 2, 1913	7796	*Fish Hawk*	1♂	68501	Beam trawl.
N. of Tortugas	25 34 30	83 01 00	27	fne. S. bk. Sp.	68	Mar. 2, 1889	5079	*Grampus*	1♀	18204	
W. of Sanibel Island	26 19 00	83 11 00	27	S. Algae	68	Mar. 21, 1889	5108	do	1♀	18203	
Off Cape San Blas	29 14 00	85 29 15	25	Co.		Feb. 7, 1885	2373	*Albatross*	1♀	17851	Holotype.

OSACHILA GALAPAGENSIS Rathbun

PLATE 82, FIGURE 5; PLATE 83, FIGURE 3

Osachila galapagensis RATHBUN, Proc. Biol. Soc. Washington, vol. 48, p. 3, 1935.

Type locality.—Wenman Island, Galapagos Islands, 100–150 fathoms; Hancock Galapagos expedition, holotype, female (69215).

Diagnosis.—The two largest branchial elevations are more extensive than in *antillensis*. Tubercles of palm sharper. Margins of ambulatories distinctly dentate.

Description.—Anterolateral margin with sharp denticles, three of which project beyond the others; the first and second of these terminate narrow, transverse ridges. The highest and largest branchial elevation is continued to the gastric region, its posterior slope divided by a wavy line of punctae, subparallel to posterior margin. Besides the tubercle at the posterior corners of the cardiac region there is a pair at the anterior corners, nearer together, narrow, oblique, and pointing backward and inward. Sides of terminal segment of female abdomen curved outward, not straight as in *antillensis*. Tubercles of palm and fingers acute and fairly well separated. Six or seven acute teeth on lower margin of palm. The thin edges of the ambulatory legs—merus, carpus, and propodus—are cut into numerous projecting teeth.

Measurements.—Female (69215), length 20.6, width 24.7 mm.

Range.—Galapagos Islands, 10 to 150 fathoms.

Material examined.—See table 84, page 255.

OSACHILA LEVIS Rathbun

PLATE 78, FIGURES 3, 4

Osachila levis RATHBUN, Proc. U. S. Nat. Mus., vol. 21, p. 612, 1898 (type locality, off Cape St. Lucas, 31 fathoms; type, U.S.N.M. no. 21598).

Diagnosis.—Carapace smooth to naked eye. Cardiac lobe single, trilobate in form, broadest in front. Surface of manus covered with coarse tubercles forming about 12 irregular, crowded rows.

Description.—Resembling *antillensis;* metabranchial lobe similar in size and shape; on the inner side of its point a small round lobe. Lobes of carapace coarsely punctate, depressions finely so. Anterolateral margin dentate in its anterior half only, the longitudinal portion subentire; the four thick posterolateral teeth project scarcely beyond the margin except for the anterior tooth which is directed slightly sideways at the lateral angle of the carapace. Upper margin of manus with three denticulated teeth.

Measurements.—Female holotype (21598), length of carapace 19.1, width 21.4 mm.

Range.—Mexico to Ecuador; 12 to 60 fathoms.

Material examined.—See table 85, page 256.

TABLE 83.—*Material examined of* Osachila antillensis

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
CUBA:	° ′ ″	° ′ ″			°F.						
Off Habana	23 10 42	82 18 24	67	wh. Co.		Jan. 19, 1885	2334	*Albatross*	2 ♂	9508	
Do	23 10 31	82 19 55	114	Co.		Jan. 17, 1885	2331	do	1 ♂	9503	Holotype.
Do						May 26, 1893		State Univ. Iowa Bahama Exped.	1 ♂	20496, S. U. I.	
ST. CROIX: Off Fredericksted	17 37 55	64 54 20	115	R. brk. Sh.	65	Jan. 5, 1879	132	*Blake*	1 ♂	2591, M. C. Z.	
									1 ♂1 ♀	2603, M. C. Z.	
Off MONTSERRAT	16 41 54	62 13 24	88		69	Jan. 16, 1879	156	do	1 ♀	2774, M. C. Z.	
Off DOMINICA	15 32 18	61 30 10	118	S. brk. Sh.	65	Jan. 24, 1879	177	do	2 ♂1 ♀	2768, M. C. Z.	
Do	15 17 20	61 24 22	138	fne. S. M.	63¾	Jan. 30, 1879	192	do	1 ♀	2922, M. C. Z.	
Off BARBADOS	13 11 54	59 38 45	73	Co. S. Sh.	70¾	Mar. 9, 1879	290	do	1 ♂	2505, M. C. Z.	
Do	13 04 12	59 36 45	76	Co. brk. Sh.	64¾	Mar. 5, 1879	272	do	1 ♀	2579, M. C. Z.	
									1 ♀	2643, M. C. Z.	
									1 ♀	17852	
Off GRENADA	11 27 00	62 11 00	164	S. Sh.	57	Feb. 27, 1879	254	do	1 ♀	2921, M. C. Z.	
Do	11 25 00	62 04 15	96	Co. brk. Sh.	58½	do	253	do	1 ♂	2731, M. C. Z.	
									1 ♂	2923, M. C. Z.	

TABLE 84.—*Material examined of* Osachila galapagensis

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
ECUADOR—Galapagos Islands:	° ′ ″	° ′ ″									
Wenman Island			100–150			Jan. 11, 1934	143	*Velero III*	1 ♂4 ♀ (1 ovig.)	69215	Largest ♀ is type: Hancock Galapagos Exped.
	Latitude S.										
Albemarle Island, Tagus Cove.	S. of Cove		30			Jan. 13, 1934	147	do	1 ♂	69212	Do.
Do	Off Cove		50–60			Jan. 15, 1934	155	do	1 ♂	69324	Do.
Do	In Cove		10–18			do	157	do	1 ♀ y	69213	Do.
Off Indefatigable Island	0 55 00	90 30 00	58–60			Jan. 26, 1934	190	do	2 ♀1 carapace	69214	Do.

TABLE 85.—*Material examined of* Osachila levis

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
	° ′ ″	° ′ ″			°F.						
MEXICO: Off Cape St. Lucas, Lower California.	22 52 00	109 55 00	31	rky	74.1	May 1, 1888	2829	*Albatross*	1 ♀ ovig	21598	Holotype.
ECUADOR:	*Latitude S.*										
La Plata Island			45–55	S., Shale, R.		Feb. 10, 1934	212	*Velero III*	1 y	69211	Hancock Galapagos Exped.
Galapagos Islands	0 55 00	90 30 00	58–60			Jan. 26, 1934	190	do	1 ♀	69755	Do.
Tagus Cove, Albemarle Island.	Off cove		50–60			Jan. 15, 1934	155	do	2 ♂ 1 ♀	69754	Do.
E. of Wreck Bay, Chatham Island.			12			Jan. 21, 1934	172	do	Fragment of carapace.	69756	Do.

OSACHILA ACUTA Stimpson

PLATE 79, FIGURES 1, 2

Osachila acuta STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 10, p. 114, 1871 (type localities, Panama and Manzanillo; types not extant).

Diagnosis.—Rostrum with thin, sharp, denticulate margin. Posterolateral margin bearing two strong triangular teeth, one next the lateral tooth, the other next the posterior extremity. Outer surface of manus with five longitudinal ridges.

Description.—Protuberances of carapace rather small, somewhat conical, tuberculated, and coarsely punctate; between them the surface is smooth, naked, and microscopically and crowdedly punctate. Rostrum flat, narrow, prominent, bilobed. Anterolateral margin with generally seven or eight teeth behind the point where the transverse subhepatic ridge joins the margin; the teeth increase in size posteriorly, each composed of two or three denticles, the median one largest where there are three. Posterolateral margin thickened as if double, and irregularly tuberculated and bidentate. The posterior extremity of the carapace is narrow, with two thickened tuberculated margins placed one above the other. Of the ridges on the outer surface of the hand, the upper three are formed of large tubercles, the lower two of small ones; superior crest with three equal teeth.

Color.—Yellowish, with spots of red and white resembling patches of lichen. (Stimpson.)

Measurements.—Male type, length of carapace 17.9, width 21 mm.

Range.—Manzanillo, Mexico, to Panama (Stimpson); Darien (Nobili); Ecuador.

Material examined.—La Libertad, Ecuador; dredged north of Point St. Elena; 8–10 fathoms; February 9, 1934; station 209, Hancock Galapagos Expedition; 1 small male (69619).

OSACHILA LATA Faxon

FIGURE 45; PLATE 78, FIGURES 1, 2

Osachila lata FAXON, Bull. Mus. Comp. Zool., vol. 24, p. 159, 1893 (type locality, Western Mexico, 80 fathoms; type in M. C. Z.); Mem. Mus. Comp. Zool., vol. 18, p. 32, pl. 5, figs. 2–2b, 1895.

Diagnosis.—Carapace expanded laterally; length : breadth = 3 : 4. Two transverse rows of low tubercles on hinder part of carapace anterior to hind margin.

Description.—Three low obtuse gastric protuberances, one cardiac, three or four branchial; the surface of all tuberculate tubercles coarsely punctate, as also the surface between protuberances. Frontal lobes thick, punctate. Anterolateral margin sharp; behind the point where the subhepatic ridge joins this margin it is divided into five obtuse,

denticulate lobes; posterolateral margin single, tuberculate; posterior margin narrow, concave; at the widest part of the carapace a short row of tubercles near and parallel to the margin. Manus sparingly tuberculate, the tubercles largest above; superior border a slight, denticulate crest split into three indistinct lobes. Edges of ambulatory legs slightly cristate.

Color.—Traces of transverse red bands on ambulatories of preserved specimen.

Measurements.—Male holotype, length of carapace 24.5, width 32 mm.

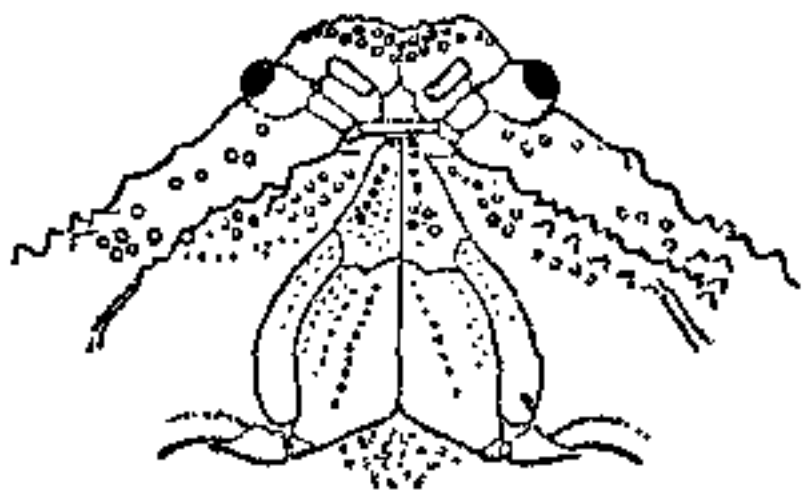


FIGURE 45.—*Osachila lata*, male: Anterior part from below. After Faxon.

Range.—West coast of Mexico.

Material examined.—As follows:

Off Tres Marias Islands; lat. 21° 22′ 15″ N., long. 106° 25′ 00″ W.; 80 fathoms; rky.; temp. 51.2° F.; Apr. 18, 1891; station 3427, *Albatross*; 1 ♂ holotype (4497, M. C. Z.).

Chamela or Perula Bay; lat. 19° 32′ 00″, long. 105° 08′ 00″ W.; 30 fathoms; S.; July 19, 1932, station T.3.R., *Zaca;* Crocker Expedition; 1 male (Calif. Acad. Sci.).

Subtribe HAPALOCARCINIDEA Verrill [27]

Hapalocarcinidea VERRILL, Trans. Connecticut Acad. Arts and Sci., vol. 13, p. 426, 1908.

Epistome feebly developed; buccal area large and arched anteriorly. Lower border of orbit little developed. Outer antennae small and extraorbital. Antennules with a large, prominent basal article. Carapace narrow and more or less oblong, or semicylindrical, not much narrowed anteriorly. Front usually subtruncate or emarginate without a central tooth. Outer maxillipeds separated at base by a sternal lobe; ischium broad, often with a convex inner lobe; merus small, seated well back, with the palp articulating in a notch of inner edge; exognath small. Chelipeds feeble, often little if any larger than the next legs; chelae simple, with acute tips. Ambulatory legs similar, short, with short, sharp, hooked claws, for strong adhesion; the posterior ones not articulated much higher up than the others. (Verrill.)

[27] This subtribe ranks among the Brachyura although of doubtful position therein. It is placed in this volume to complete the series of marine brachyurans of America.

Family HAPALOCARCINIDAE Calman

Hapalocarcinidae CALMAN, Trans. Linn. Soc. London, Zool., ser. 2, vol. 8, p. 3, 1900 ("Incertae sedis").—BORRADAILE, *in* Gardiner's The fauna and geography of the Maldive and Laccadive Archipelagoes, vol. 1, p. 271, 1902; Ann. Mag. Nat. Hist., ser. 7, vol. 19, p. 483, 1907.—VERRILL, Trans. Connecticut Acad. Arts and Sci., vol. 13, p. 427, 1908.—POTTS, Pap. Marine Biol. Carnegie Inst. Washington, vol. 8, p. 67, 1915.—RATHBUN, U. S. Nat. Mus. Bull. 97, p. 15, 1918.—SHEN, Hong Kong Nat., suppl. 5, p. 21, 1936.

Merus of third maxillipeds small, bearing terminally a carpus of nearly its own width; ischium very broad. Body somewhat oblong. Antennules not retractile into sockets. Parasitic or symbiotic in corals.

KEY TO THE AMERICAN GENERA OF THE FAMILY HAPALOCARCINIDAE

A[1]. Carapace smooth, anterolateral margin entire.....**Hapalocarcinus** (p. 259)
A[2]. Carapace more or less granulate or spined, anterolateral margin *denticulate*.....***Cryptochirus*** *(p. 262)*

Genus HAPALOCARCINUS Stimpson

Hapalocarcinus STIMPSON, Proc. Boston Soc. Nat. Hist., vol. 6, p. 412, 1859 (type, *H. marsupialis* Stimpson).

Front of carapace not bent downward; anterolateral margin and front not denticulate. Antennules not retractile into fossettes; antennae very small and orbits ill defined. Basal article of antennules with a stout dentiform lobe anteriorly. Abdomen of female much enlarged. Live in galls, which are formed to accommodate the crabs by the corals on which they make their homes.

Islands of the Pacific and Indian Oceans; west coast of Central and South America.

HAPALOCARCINUS MARSUPIALIS Stimpson

FIGURE 46; PLATE 79, FIGURES 3-9

Hapalocarcinus marsupialis STIMPSON, Proc. Boston Soc. Nat. Hist., vol. 6, p. 412, 1859 (type locality, Hilo, Hawaii; type not extant); Smithsonian Misc. Coll., vol. 49, p. 170, pl. 14, fig. 8, 1907.—CALMAN, Trans. Linn. Soc. London, ser. 2, vol. 8, p. 43, pl. 3, fig. 29–40, and synonymy, 1900.—BORRADAILE, *in* Gardiner's The fauna and geography of the Maldive and Laccadive Archipelagoes, vol. 1, p. 271, 1902.—RATHBUN, Bull. U. S. Fish Comm. for 1903, pt. 3, p. 892, 1906; Trans. Linn. Soc. London, ser. 2, vol. 14, p. 242, 1911.—POTTS, Pap. Mar. Biol. Carnegie Inst. Washington, vol. 8, p. 35, figs. 5C, 6B, 7B and D, 8B, 9–15, pls. 1, 2, 1915.—EDMONDSON, Bernice P. Bishop Mus. Bull. 5, p. 24, 1923.—SHEN, Hong Kong Nat., suppl. 5, p. 22, 1936.—SCHMITT, Explorations and field-work of the Smithsonian Institution in 1935, pp. 34–36, figs. 36a-f, 1936.

Description.—Female. Carapace soft and membranous, depressed, *broadly oval in outline and truncated in front and behind.* Breadth equal to, or a little less than length. Front slightly deflexed, bidentate (or obscurely tridentate). Lateral margins rounded off dorso-

ventrally and evenly arcuate from before backward. Posterior margin concave and about three-fifths as long as anterior margin. Surface smooth. First three abdominal segments visible from above, remaining four bent under the body, forming a broad oval plate equal in size to the carapace. Ocular peduncles large, subconical, not in distinct orbits; corneae devoid of pigment. Antennules large, exserted;

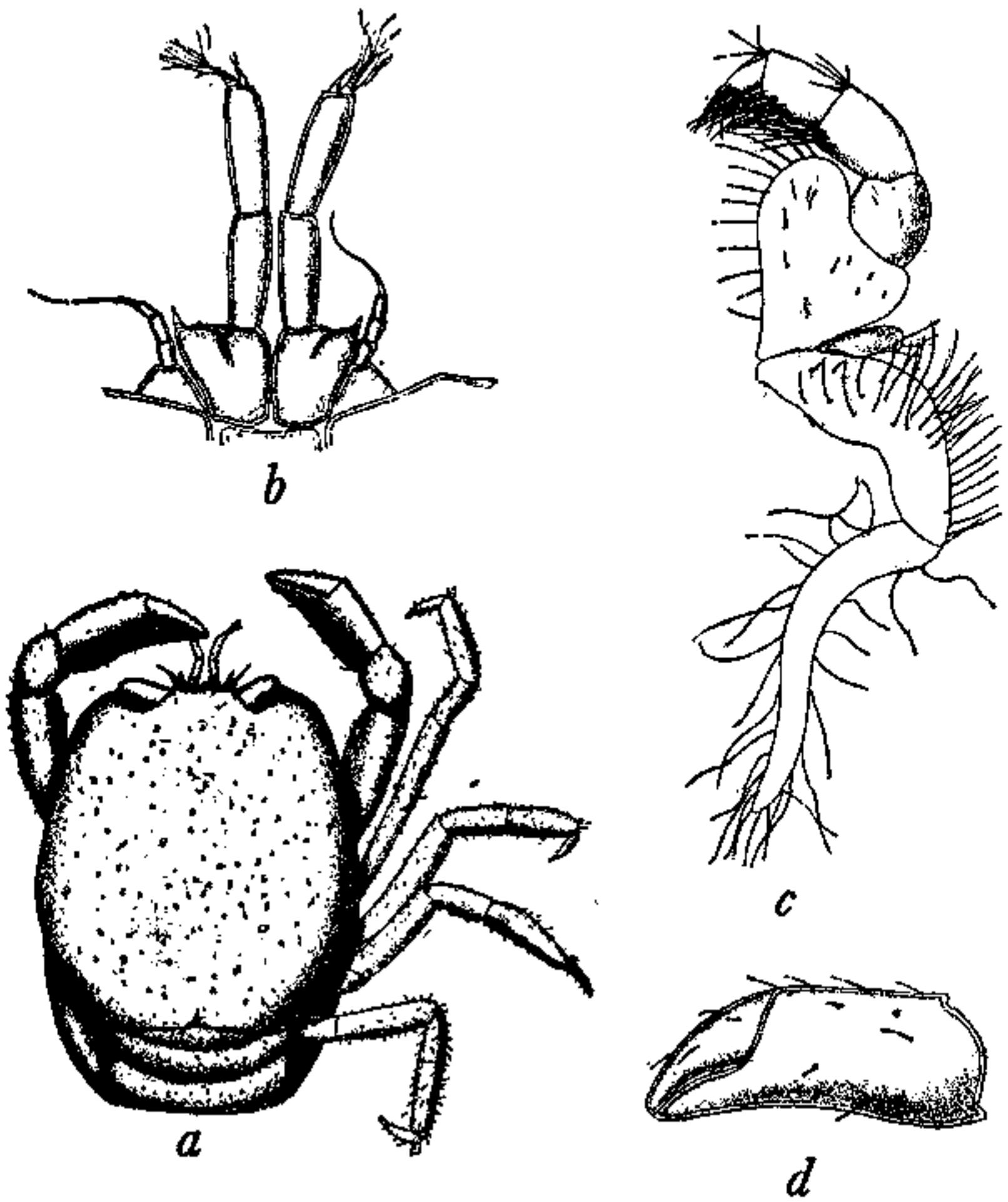


FIGURE 46.—*Hapalocarcinus marsupialis*, female: *a*, Dorsal view, x13; *b*, antennae and antennules; *c*, third maxilliped; *d*, chela. After Calman.

antennae 5-jointed. Buccal area very large. The third maxillipeds do not nearly cover the buccal cavity and are widely separated from each other at the base by a semicircular area of the sternum. Ischium flattened, subtriangular, widening from a narrow base, its antero-internal angle produced forward, rounded and fringed with setae; merus articulated with the outer end of distal margin. Exopod rudimentary, epipod well developed. Chelipeds rather stout, about

TABLE 86.—*Material examined of* Hapalocarcinus marsupialis

Locality	Bearings		Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	Latitude N.	Longitude W.									
COLOMBIA: Port Utria	Reef inner side outer isle.		Shore	Low tide in *Pocillopora*.		Feb 15, 1934	239	*Velero III*	4♀	69177	Hancock Galapagos *Exped.*
HAWAIIAN ISLANDS:											
Hawaii	Hilo					Mar. 2, 1926		Fed. Hort. Board, Seattle.	1♀	59501	Taken from a large piece of coral in crew's quarters of the S. S. *Montgomery City* from Hilo.
Do	Kailua					Aug., 1901		*Albatross*	1♀	25311	
Do	Kainaliu		In shore	Algae		July 6, 1914		W. A. Bryan	2♀	48968	
Do				In coral		1930		Paul S. Galtsoff	2♀	64210, 64211	U. S. Bureau of Fisheries.
Molokai	Pukoo		Reef	Low tide				College of Hawaii.	1♀	48955	
Oahu	Between Waikiki beach and Honolulu harbor.		Reef					J. C. Bridwell	1♀	49047	
WESTERN INDIAN OCEAN: Salomon.	*Latitude S.*					1905		H.M.S. *Sealark*; J. Stanley Gardiner.	1♀, 1♀	41373	

twice the diameter of the legs; hand not much thicker than preceding joints; palm less than twice as long as broad, nearly twice as long as fingers. (After Calman.)

Measurements.—Length of carapace of female (69177) 5.8, width 5.5 mm.

Range.—Indian Ocean, Torres Straits, Palmyra Island, and generally through the Pacific northward to Hawaii. Philippines (Semper). Colombia, South America; Secas Islands, Panama (Hancock Galapagos Expedition). The female crab forms galls on certain species of corals of the genera *Pocillopora, Seriatopora, Stylophora, Sideropora* and *Millepora* (Edmondson). Coral-galls, possibly due to this species, are known from the Red Sea, Ceylon, and China Sea (Calman).

Material examined.—See table 86, page 261.

Genus CRYPTOCHIRUS Heller

Cryptochirus HELLER, Verh. zool.-bot. Ges. Wien, vol. 11, abh., p. 19 [17], 1861 (type, *C. coralliodytes* [later and obviously corrected spelling]); Sitzb. Akad. Wiss. Wien, vol. 34, abt. 1, p. 366, 1861.

Lithoscaptus A. MILNE EDWARDS, Ann. Sci. Nat., Zool. (ser. 4), vol. 17, p. 362, 1862 (type, *L. paradoxus* Milne Edwards); *in* Maillard, Notes sur l'Isle de la Réunion, pt. 2, annexe *F*, p. 10, 1862, and ed. 2, vol. 2, annexe *F*, p. 10, 1863.

Troglocarcinus VERRILL, Trans. Connecticut Acad. Arts and Sci., vol. 13, p. 427, 1908 (type, *T. corallicola* Verrill).

Front of carapace abruptly bent downward and operculum-like; anterolateral margin and front denticulate. Eyes not retractile; orbits feebly developed, a spine on outer margin.

Bermudas, Straits of Florida, West Indies; Gulf of Guinea.

CRYPTOCHIRUS CORALLICOLA (Verrill)

FIGURE 47; PLATE 78, FIGURES 5–7

Troglocarcinus corallicola VERRILL, Trans. Connecticut Acad. Arts and Sci., vol. 13, p. 427, fig. 48, 49, a, b, c; pl. 28, fig. 8, 1908 (type locality, Dominica, B. W. I.; type in Peabody Mus., Yale Univ.).—BALSS, Crust. VII *in* Michaelson, Westafrika, vol. 3, lief. 3, p. 87, 1922.

Cryptochirus corallicola EDMONDSON, Occ. Pap. B. P. Bishop Mus., vol. 10, no. 5, p. 5, 1933.—SHEN, Hong Kong Nat., suppl. 5, p. 22, 1936.

Description.—Carapace oblong, transversely convex; sides nearly parallel posteriorly; front bent abruptly downward and covered with small, unequal, sharp spinules and hairs to which dirt, etc., firmly adheres; front edge minutely notched at middle and finely spinulated; anterolateral margin with a row of fine sharp spinules; upper surface, back of the frontal bend, hairy and granulated, the granules larger anteriorly and toward the sides; minute posteriorly. The sloping anterior part of the carapace has a concave area each side of the median line. The anteromarginal spines decrease in size backward;

the one at the exterior edge of orbit is largest. Carapace much higher or thicker in front, especially at the bend, than posteriorly. Sternum smooth, concave at middle; genital openings of female lunate, near together on sternum.

Eyes small on thick, short stalks; orbits looking forward. Pedicels of antennules large, longer than eyestalks, rather stout, near together, spinulous distally, with about three longer terminal spinules; remaining articles small, folding vertically, tips reaching but little beyond eyes. Antennae small, about as long as eyestalks. Outer maxillipeds with merus short and broad, with a decided notch on inner distal edge at articulation of palp; ischium broader than long, with a rounded or semicircular lobe on inner margin; exognath small and short; the large palps occupy about all the space to bases of antennules. The anterior lobe of sternum separates the bases of the maxillipeds. Legs and maxillipeds very hairy.

Chelipeds small, smaller than first ambulatory legs; hairy; chelae small, with simple, acute digits. Ambulatories short, incurved, with

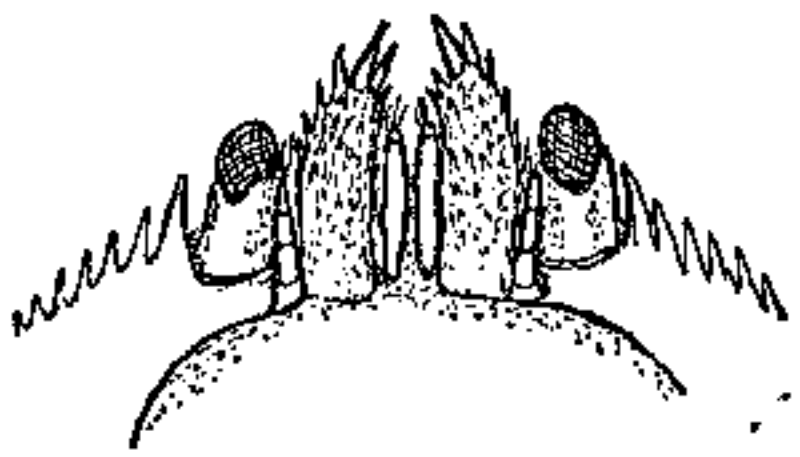


FIGURE 47.—*Cryptochirus corallicola*, female: Anterior parts from below, much enlarged. After Verrill.

simple, sharp, incurved claws; posterior legs becoming shorter, but similar to the others, articulated slightly higher up. Abdomen convex, the rings thin, somewhat indurated above; in the female the edges are expanded and form a well developed egg-pouch below. (Verrill.)

Color.—As follows:

Station 28–31. Sepia (with sage greenish tinge when seen through hand lens). Nearly black in fore half of carapace, lighter behind with a narrow median streak. Chelae and carpi almost sage green above; fingers whitish to transparent; ischium and basis of ambulatories whitish, merus like carapace, succeeding article whitish with few marks of carapace color. (W. L. Schmitt.)

Female (67748). Anterior fifth of carapace sort of bay, shading over into middle third of carapace which is a sort of olive to tawny, shading to Indian or saffron yellow in hinder part of abdomen; carapace and abdomen all red specked; telson like middle third of carapace; color of abdomen due to eggs; epimera of abdomen white. (W. L. Schmitt.)

Measurements.—Female (61517), length of carapace 5.7, width 3.7 mm.

Habitat.—Lives in oven-shaped cavities or dens formed in the upper surface of living corals; the opening of the den is usually semicircular or lunate, commonly oblique to surface of coral. The downturned, rough, and dirt-covered front of the crab serves as an operculum, closing the aperture. Full-grown crabs are probably unable to leave their dens.

Range.—Bermudas; Straits of Florida; Dominica, B. W. I., 3 to 5 fathoms. Ilha das Rolas, off St. Thomas Island, Gulf of Guinea. (Balss.)

Material examined.—Tortugas, Florida; gift of Carnegie Institution: Symbiotic on coral, *Meandra areolata;* July–August 1925; H. Boschma; 5 males, 11 females (2 ovigerous) (59964). In mouth ridges of *Meandra;* July 1925; H. Boschma; 1 male, 2 females (1 ovigerous) (59973). August 1927; Wm. H. Longley; 1 female (61517). Seven corals with burrows containing crabs; Bush Key Reef; station 21; 1926; C. R. Shoemaker; 4 males, 8 females (4 ovigerous) (67747). From *Meandrina;* Bush Key Reef; station 29; July 23, 1930; Mr. Visscher; 3 ovigerous females (67748). In stomach of Fish no. 280, *Apogon sellicauda* Evermann and Marsh; off N. end of Loggerhead Key; June 9, 1925; W. L. Schmitt; 1 male (67749). From *Meandrina;* off E. side of Loggerhead Key; station 31; July 18, 1931; W. L. Schmitt; 2 females (67750).

Subtribe BRACHYGNATHA De Haan

Brachygnatha DE HAAN, *in* Franz de Siebold, Fauna Japonica, pp. XI–XIII, 1850.—BORRADAILE, Proc. Zool. Soc. London, 1900, p. 571; *in* J. Stanley Gardiner, The fauna and geography of the Maldive and Laccadive Archipelagoes, vol. 1, pt. 4, pp. 425, 426, 1903; Ann. Mag. Nat. Hist., ser. 7, vol. 19, pp. 466, 468, 477, 1907.—RATHBUN, U. S. Nat. Mus. Bull. 97, p. 14, 1918.

Last pair of legs normal, rarely reduced, not dorsal, except in *Cymopolia* and *Retropluma.* Female openings sternal. First abdominal limbs of female wanting. Gills few.

Superfamily BRACHYRHYNCHA Borradaile

Brachyrhyncha BORRADAILE, *in* J. Stanley Gardiner, The fauna and geography of the Maldive and Laccadive Archipelagoes, vol. 1, pt. 4, pp. 425, 426, 1903; Ann. Mag. Nat. Hist., ser. 7, vol. 19, pp. 468, 479, 481, 1907.—RATHBUN, U. S. Nat. Mus. Bull. 97, p. 14, 1918.

Fore part of body broad. Rostrum usually reduced or wanting. Body oval, round, or square. Orbits nearly always well inclosed.

Family GONEPLACIDAE Dana

Gonoplacidae DANA, Amer. Journ. Sci., ser. 2, vol. 12, p. 285, 1851; United States Exploring Expedition, Crustacea, pt. 1, pp. 208 and 310, 1852; pt. 2, p. 1425, 1853.—ALCOCK, Journ. Asiat. Soc. Bengal, vol. 69, pp. 283, 286, 292, 297, and synonymy, 1900.

Goneplacidae RATHBUN, U. S. Nat. Mus. Bull. 97, p. 15, 1918.

The palp of the external maxillipeds articulates at or near the anterointernal angle of the merus; the exognath is of normal size and is not concealed. The interantennular septum is a thin plate. The division of the orbit into two fossae is usually not indicated. The genital ducts of the male usually perforate the base of the last pair of legs, often passing forward through a groove in the sternum.

Subfamily CARCINOPLACINAE Miers

Carcinoplacinae MIERS, Voyage of H. M. S. *Challenger*, Brachyura, vol. 17, p. 222, 1886.—RATHBUN, U. S. Nat. Mus. Bull. 97, pp. 16, 17, 1918.

Pseudorhombilinae ALCOCK, Journ. Asiat. Soc. Bengal, vol. 69, pp. 286, 292, and 297, 1900.

Carapace xanthoid, the regions seldom well defined; front usually of good breadth and square cut, often little deflexed; eyes and orbits usually of normal size and form, the eyes well pigmented and the eyestalks normally movable except in certain deep-sea genera; the antennules fold transversely; antennal flagella of medium length. Epistome well defined; buccal cavern square-cut and usually completely closed by the external maxillipeds, which have a subquadrate merus. The base of the third segment of the male abdomen covers the whole space between the last pair of legs. Male openings not sternal.

Represented in America by four genera, the other three of which have been previously discussed in Bulletin 97, "The Grapsoid Crabs of America."

Genus GERYON Krøyer

Geryon KRØYER, Nat. Tidsskrift, vol. 1, p. 1, pp. 20–21, 1835 (type, *G. tridens* Kröyer).

Chalaepus GERSTAECKER, Arch. für Naturg., vol. 22, pt. 1, p. 118, 1850 [type, *C. trispinosus* (Herbst)].

Carapace broader than long, anteriorly arcuate, posteriorly truncate, longitudinally strongly convex; front broad, deflexed, but little arcuate; anterolateral margins not recurved and provided with strong teeth. Branchial region prominent, hepatic region less so; eye peduncles short, stout; lower margin of orbit separated from the front, and orbit separated from the antennular fossa; superior margin

TABLE 87.—*Material examined of* Geryon quinquedens

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″			°F.						
NOVA SCOTIA:											
SE. of	43 20 00	59 30 00	200			1879	Gl. Don. 409	Sch. *Procter Brothers.*	1 ♀	40010	
S. of	Between 42 55 00 and 44 46 00	Between 59 04 00 and 62 35 00	50–65			Sept. 21, 1880	Gl. Don. 846	Sch. *Mist*	1	38230	
S. of Halifax; Banquereau.	42 37 00	62 55 00	200			Sept. 22, 1880	Gl. Don. 848	Sch. *Augusta H. Johnson.*	1		
S. of; E. part of La Havre Bank.	Between 42 34 00 and 43 26 00	Between 63 50 00 and 65 07 00	275			Nov. 6, 1879	Gl. Don. 541	Sch. *Grace L. Fears.*	1	40009	
SW. of; Seal Island Ground.						June 29, 1880	Gl. Don. 751	Sch. *Otis P. Lord.*	3	A. E. V.	To A. E. Verrill.
MAINE: Off Casco Bay.			Deep water.						2	P. M. Y. U.	Cotypes. At Peabody Mus.
MASSACHUSETTS:											
Off Georges Bank	42 02 00	68 27 00	105	bu. M.		Aug. 29, 1883	2053	*Albatross*	1 ♂	5811	
South Channel	Between 41 05 00 and 41 20 00	Between 69 00 00 and 69 15 00				Aug. 3, 1880	Gl. Don. 787	Sch. *Sultana*	1	3804	
Do			100			June 26, 1880	Gl. Don. 747	do	1 1 ♀	3690 18756	
Gulf of Maine	42 58 00	69 14 00	46			1879	Gl. Don. 510	Sch. *Rutherford B. Hayes.*	1	A. E. V.	
40 miles E. of Cape Ann.	42 38 00	69 38 00	160	sft. M.	37½–38	Aug. 19, 1877	35	Str. *Speedwell*	2	40000	Cotypes figd.
Off Cape Ann	42 33 00	69 35 00	100–110	M. St.		Aug. 31, 1878	192–193	do	1 ♂ 1 ♂ 2 ♀	18754 P. M. Y. U.	Cotypes.
14 miles SE. of Cape Ann.	Eastern Light Thatchers Island NW. ⅛ N. 13½ mi.		98	sft. M.	39¼	Sept. 2, 1878	199	do	Fragments of large specimen.	Noted by Smith.	Cotype. Stomach of codfish.
Cape Cod Light S. 22° W., 14 miles.	42 16 00	69 56 00	94	br. M.	41½	Sept. 10, 1879	342	do	3 ♂ 1 ♀ 1 y. 4 2 ♂	3915 18755 A. E. V. 39999	
Cape Cod Light S. 51° W., 15 mi.	42 11 45	69 47 00	122	sft. br. M.	41	Aug. 21, 1879	303	do	3	A. E. V.	
Cape Cod Light S. 68° W., 18 mi.	42 09 30	69 41 00	118	sft. br. M.	41	do	305	do	1 ♂ 2 ♀ (y.) 3	18753 40003	

Cape Cod Light S. 88° W., 30 mi.	42	03	00	69	22	00	106	gy. M.		Sept. 18, 1879	360	do	2 ♀	3939	
Off Cape Cod	41 58 to 42 03	30 00		69 to 69	22 22	00 44	70–106			do	360, 364	do	2	A. E. V.	
Cape Cod Light SW. ¾ W., 13¾ mi.							110	gy. M.	38½	Aug. 2, 1882	1090	*Fish Hawk*	2 ♂ 1 ♀ 10+y	5797 18752	Stomach of hake.
Eastern Point Light W. by N.							100–110	M.		Aug. 31, 1878	192–194	*Speedwell*	1	A. E. V.	Cotype.
19¾ mi. NE. of Race Point.	42	20	00	70	00	00	117	sft. bu. M.		1873	37B	*Bache*	1 ♀ sm.	39942	Cotype.
23½ mi. ENE. ¼ N. from Race Point.	42	18	00	69	49	00	142	sft. bu. M.	39–42	Sept., 1873	36B	do	1 ♀	39941	Cotype.
Minots Ledge Light W., 5½ mi.	42	16	00	70	38	00	22	P. brk. Sh.	44½	Sept. 13, 1879	346	*Speedwell*	1	A. E. V.	
Massachusetts Bay							Deep water.					Wm. F. Clapp	1	65918	
SE. of Nantucket	40	01	00	68	54	00	640	fne. S. gn. M. limestone nodules.	39	Aug. 26, 1882	1124	*Fish Hawk*	1 ♂ y.	4759	
Do	39	57	06	69	16	00	458	yl. M. S.	40	Sept. 14, 1881	1029	do	1 ♂	14356	
Do	39	49	25	69	49	00	616	gn. M. S. with lumps of clay.	40.5	Aug. 4, 1881	937	do	1 ♂	14355	
S. of Nantucket	39	51	30	70	17	00	571	gn. M.	39.5	Aug. 8, 1885	2549	*Albatross*	2	10583	
Do	39	53	30	70	17	30	538	gn. M.	39.6	do	2546	do	2 9	10581 Woods Hole	At Woods Hole Lab.
Do	39	54	30	70	20	00	390	gn. M.	39.6	do	2547	do	2 sm.	10582	
S. of Marthas Vineyard.	40	02	54	70	23	40	115	M. fne. S.	49	Sept. 4, 1880	871	*Fish Hawk*	1 y.	39940	
Do	39	49	30	70	26	00	600	gn. M. S.	39.7	Aug. 4, 1884	2189	*Albatross*	1 ♀	8036	
Do	39	50	00	70	26	00	555			July 16, 1886	2680	do	1 ♂ 1 ♀ 3	11692 11693	
Do	39	55	00	70	28	00	396	yl. M. S.	40	Aug. 23, 1881	952	*Fish Hawk*	1 ♀ sm.	3363	
Do	39	59	30	70	30	45	428	gn. M.	40	Aug. 22, 1884	2212	*Albatross*	1 ♂ 1 ♀	8175	
Do	39	44	30	70	30	45	1081	br. M.	38.5	Aug. 9, 1885	2550	do	4	10584	
Do	39	49	15	70	31	45	578			Aug. 22, 1884	2215	do	1 1	A. E. V. S. I. S.	To S. I. Smith.
Do	39	47	07	70	35	00	721	gy. Oz.	39.6	Aug. 9, 1885	2552	do	8 2	10585 Woods Hole	
Do	39	48	00	70	36	00	551	gn. M.	39.2	do	2553	do	6	10586	
Do	39	48	30	70	40	30	445	gn. M.	39.6	do	2554	do	2 sm.	10587	
Do	39	46	30	70	54	00	325	M.	42	Sept. 13, 1880	881	*Fish Hawk*	1 ♀	40008	
Do	39	52	15	70	55	30	353	gn. M. S.	39.7	Aug. 2, 1884	2186	*Albatross*	2 ♂	8037	
Do	39	52	20	70	58	00	372	sft. br. M. sm. St.	40	Oct. 2, 1880	893	*Fish Hawk*	1 ♂	40007	

TABLE 87.—*Material examined of* Geryon quinquedens—Continued

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
	° ′ ″	° ′ ″									
NOVA SCOTIA—Con.											
SW. of Marthas Vineyard.	39 37 00	71 08 00	835	R. gn. M.		July 18, 1886	2691	*Albatross*	5	11695	
Do	39 49 30	71 10 00	420	gn. M. S.	39.7	Aug. 3, 1884	2187	do	3	8035	
Do	39 39 00	71 11 00	643	gn. M.		July 18, 1886	2690	do	3 1	11694 A. M. E.	To A. Milne Edwards.
Do	39 58 00	71 13 00	207	gn. M. S.	44	Aug. 9, 1881	945	*Fish Hawk*	3	5838	Stomach of *Raia levis*.
Do	39 53 30	71 13 30	319	S. M.	44	do	947	do	2 ♂ 2 ♀ sm.	3362	
Do	39 55 30	71 14 00	247	gn. M. S.	47	do	946	do	1 ♀	3361	
Do	39 42 00	71 15 30	525	gn. M.		July 18, 1886	2689	*Albatross*	1	11696	
Do	39 42 00	71 17 00	705	gn. Oz.	38.7	Sept. 19, 1887	2749	do	1 ♀	12896	
Do	39 35 00	71 18 45	1073	gy. Oz.	38.1	Aug. 20, 1884	2205	do	1	S. I. S.	
S. of Marthas Vineyard to S. of Block Island.			384–1178			Aug. 19–22, 1884		do	55	8188	
RHODE ISLAND:											
Off Block Island	39 40 00	71 30 00	368	M.	40.5	Sept. 8, 1881	994	*Fish Hawk*	1 1	S. I. S. A. E. V.	
Do	39 43 00	71 34 00	394	gn. M.		Sept. 13, 1885	2581	*Albatross*	1	11107	
Do	39 39 45	71 35 15	538	bu. M.	39.5	Aug. 19, 1884	2201	do	2	S. I. S.	
Do	39 38 00	71 39 45	515	gn. M.	39.1	do	2202	do	5	8172	
Do	39 34 15	71 41 15	705	gn. M. S.	38.9	do	2203	do	1	A. E. V.	
Do	39 38 00	71 42 00	500	gn. M.	39.2	Aug. 10, 1885	2561	do	7 2	10589 10588	Woods Hole.
Do	39 29 45	71 43 00	588	bu. M.		May 26, 1883	2030	do	1 6 16	5612 5719 14368	A. E. Verrill. A. E. Verrill.
Do	39 25 30	71 44 00	861	gn. M.	39	July 23, 1884	2182	do	1	8002	
Do	39 30 30	71 44 30	728	br. M.	39.1	Aug. 19, 1884	2204	do	1	A. E. V.	
Do	39 29 00	71 46 00	693	gy. M. fne. S.	39	July 23, 1884	2181	do	4 ♂ 1 ♀ 1	7999 8004	
NEW YORK:											
S. of Long Island	39 29 50 to 39 30 10	71 50 00 to 71 49 30	510–523	bk. M.	39.5	July 23, 1884	2179, 2180	do	32 ♂ 22 ♀	8000	
Do	39 34 00	71 56 00	374	fne. S. sft. M. P.	40	Sept. 8, 1882	1140	*Fish Hawk*	1 1 1 2 ♂ 3 1 ♂ 1 ♀	4941 4042 4943 5884 14354 41495 A. M. N. H.	Bureau of Fisheries.

Do	39	32	00	72	00	00	322	M. S. P.	41	Sept. 8, 1882	1142	do	4	39997	
Do	39	29	00	72	01	00	452	sft. M.	40	do	1143	do	1 ♂	41494	
Do	39	13	00	72	01	00	594	gn. M.		Sept. 20, 1886	2722	*Albatross*	2	12246	
Do	39	09	00	72	03	15	810	gn. M.	38.6	Sept. 13, 1884	2234	do	3 ♀ 4	8626 14370	
Do	39	12	00	72	03	30	707	gn. M.	38.8	do	2235	do	20 2	8627 14371	
Do	39	12	17	72	09	30	520	gn. M.	39.5	do	2237	do	11 ♂	8628	
Do	38	56	00	72	11	30	813	gy. Oz.		Sept. 20, 1886	2721	do	1 ♂ sm. 1	11948 11943	A. E. Verrill.
Do	39	05	30	72	23	20	541	gy. M.	39.5	Sept. 19, 1885	2584	do	2	11105	
Do	39	02	40	72	40	00	328	dk. gy. M.	40.2	Sept. 20, 1885	2586	do	1 ♀ sm. 8	11081 11106	
DELAWARE:															
Off Delaware Bay	38	42	00	73	05	30	224	gn. M.	41.7	Sept. 18, 1887	2745	do	1	12896	A. E. Verrill.
Do	38	28	00	73	22	00	435	M.	40	Oct. 10, 1881	1049	*Fish Hawk*	1 ♂ sm. 1 ♂	13851 4944	
Do	38	36	30	73	06	00	630	gn. M.	39.2	Sept. 12, 1884	2233	*Albatross*	1	14369	
Do	38	35	00	73	05	15	554	bn. M.	38.9	Sept. 18, 1887	2744	do	1	12895	
Do	38	20	30	73	26	40	395	dk. gy. Oz. Clay.	41	1880	331	*Blake*	1 ♂	13850	
MARYLAND:															
E. of	38	01	15	73	44	00	568	gn. M.	39	July 20, 1884	2172	*Albatross*	1 ♀	8003	
Do	37	59	30	73	48	40	444	gn. M.	39.5	do	2171	do	1 ♂	8001	
VIRGINIA:															
E. of	37	46	30	73	56	30	865	gn. M.	37.9	Sept. 17, 1887	2742	do	1	12894	
Do	37	34	30	73	58	00	811	gy. M.	38.1	do	2739	do	1 1	12738 12893	
Do	36	42	00	74	30	00	727	gn. M. For.		Oct. 25, 1886	2730	do	5	12245	
NORTH CAROLINA:															
NE. of Cape Hatteras.	35	45	30	74	48	00	263	Glob. Oz.	41½	1880	332	*Blake*	1	4945	
Off Cape Fear	32	39	00	76	50	30	478	gn. M.	39.3	May 6, 1886	2677	*Albatross*	1	11362	
SOUTH CAROLINA:															
Off Cape Romain	32	36	00	77	29	15	258	gy. S. bk. Sp.		Oct. 21, 1885	2624	do	1	13994	
Do	32	24	00	76	55	30	528	yl. M.		do	2628	do	1 ♂	11216	
FLORIDA:															
Off Fernandina	31	09	00	79	33	30	352	gy. S. dead Co.	43.7	May 5, 1886	2669	do	1	14373	
Do	30	47	30	79	49	00	270	gy. S.	48.3 °C.	do	2666	do	1 ♂	14376	
Gulf Stream off Cape Florida.	6 mi. E. of Fowey Rocks Light.						200	gy. M.	8.8	Mar. 5, 1903	7514	*Fish Hawk*	1 ♂ 1 ♀	33466	
Do	3½ mi. E. of Fowey Rocks Light.						160	fne. gy. S.	9.4	Mar. 30, 1903	7515	do	1 ♂	33464	
Do	3⅞ mi. SE. by E. ½ E. of Fowey Rocks Light.						170	sft.	10.5	Mar. 25, 1903	7512	do	1 ♂	33465	

TABLE 87.—*Material examined of* Geryon quinquedens—Continued

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temperature	Date	Station	Collector	Specimens	Catalog No.	Remarks
FLORIDA—Continued	° ′ ″	° ′ ″			° F.						
Off Carysfort	25 20 30	79 58 00	217	gy. S.	42.6	Apr. 9, 1886	2642	*Albatross*	2	11363	
Gulf Stream, off Key West.	24 15 00	81 47 30	306	S.	47.5	Feb. 19, 1902	7285	*Fish Hawk*	1 ♂	54047	
Tortugas	18 mi. due S. of no. 2 red buoy.		205–221			July 3, 1931	18	W. L. Schmitt	2 ♂ 1 ♀ ovig. (out of 20 collected).	68205	Gift of Carnegie Institution.
Do			220–237			July 31, 1930	38	do	2 ♀	71112	Do.
Do						1931		Paul Bartsch	1 ♀ ovig	68204	Do.
Do						1931		J. P. Visscher	1 ♂	Western Reserve Univ.	Do.
ALABAMA:											
Between Cedar Keys, Fla., and Delta of Mississippi.	28 47 30	87 27 00	724	br. gy. M.	40.7	Mar. 13, 1885	2392	*Albatross*	1	10066	
Do	28 45 00	88 15 30	940	bu. M.	39.6	Mar. 3, 1885	2384	do	1	10065	
BRAZIL: Off Cape Frio.	*Latitude S.* 24 17 00	42 48 30	671	br. Glob. Oz.	37.9	Dec. 30, 1887	2763	do	1 ♂ sm.	22072	

of orbit more prominent than inferior. Basal article of outer antenna free and movable; second article not reaching beyond the front; flagellum longer than twice length of first three articles. Second and third ambulatories subequal, exceeding the others in length.

Western Europe; Nova Scotia to Brazil; Bermudas; southern Africa; Indian Ocean; East Indies; Japan.

GERYON QUINQUEDENS Smith

DEEP SEA RED CRAB

PLATES 85, 86

Geryon quinquedens SMITH, Trans. Connecticut Acad. Arts and Sci., vol. 5, p. 35, pl. 9, figs. 1, 1a, 1b, 2, 1879 (type localities, off Casco Bay, Maine, and off Massachusetts Bay, Gulf of Maine; cotypes in U. S. N. M. and P. M. Y. U.).

Diagnosis.—Five anterolateral teeth; four acute frontal teeth; a strong spine at inner angle of carpus of cheliped and a very small spine on distal margin; a small spine near distal end of upper margin of merus.

Description.—Carapace of larger specimens, including lateral spines, about one-third broader than long. Dorsal surface very convex longitudinally but only slightly transversely, entirely naked, finely but irregularly granulated, and not deeply areolated. The most prominent elevation is a short, rounded, transverse ridge each side, between the base of lateral spine and the posterior portion of the gastric region. Breadth of front between tips of inner angles of orbits equaling width of orbits. Median teeth of front near together, triangular, and deflexed below the level of inner angles of orbits, in front of which they project for almost or quite their whole length. Outer angles of orbits acutely angular. The next tooth (the second of the five anterolateral teeth) is a well-developed angular projection of the margin, but less prominent than the first and not acutely angular. Third tooth prominent, acutely triangular, scarcely spiniform. Fourth tooth represented by a distinct but only slightly angular emargination. Posterolateral margins nearly straight. In young specimens the three larger anterolateral teeth are more acute and spiniform than in larger specimens. Inner angle of inferior margin of orbit triangular, not slender, falling short of either of the other orbital angles and reaching but slightly beyond third segment of antenna.

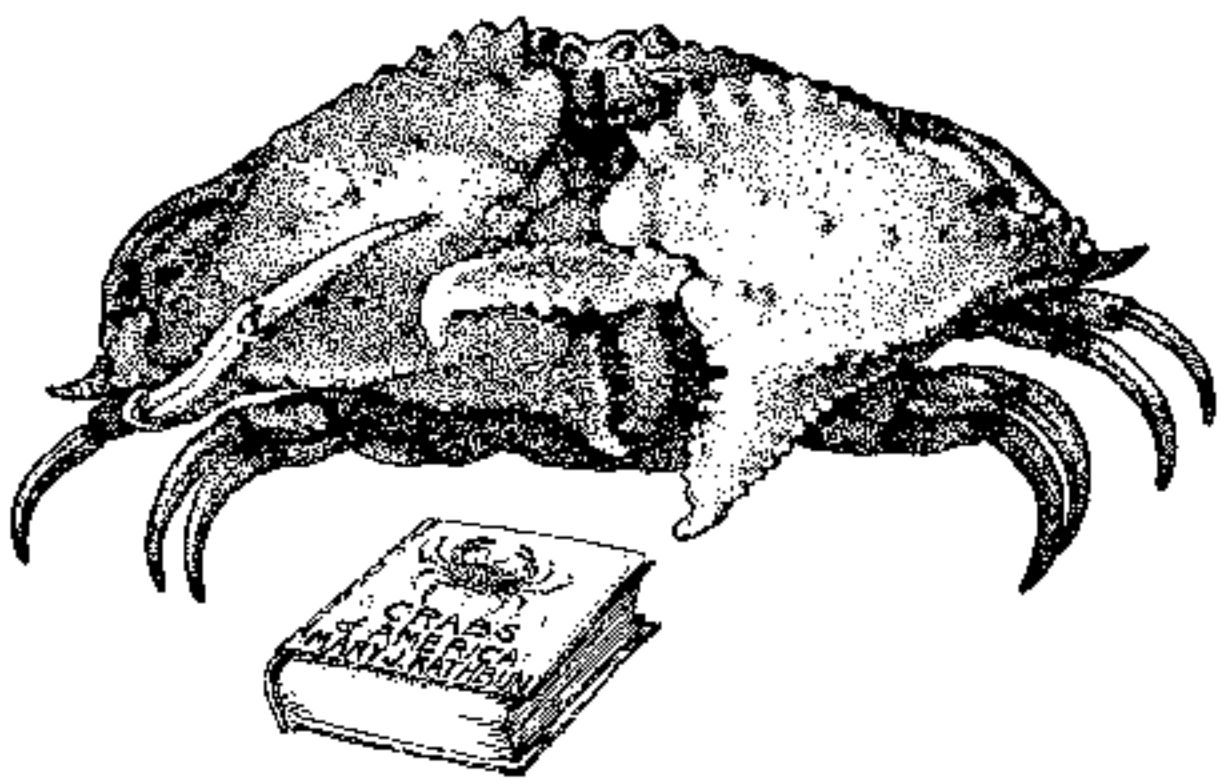
Chelipeds slightly unequal and rather slender. The fingers on each hand are about as long as basal portion of propodus and their thin prehensile edges are armed with sharp serrations which slightly overlap when the dactylus is closed; a small obtuse tubercle near base of larger dactylus.

Color.—Tortugas no. 38–30, general color cream-buff. Tips of frontal and anterolateral spines dark colored, approaching russet. Inner margin of orbit and antennal flagella ochraceous-buff. A large area behind the anterior and anterolateral rim more ochraceous and vinaceous-buff intermingled. Curved linear depressions behind mesogastric region vinaceous. Longitudinal gastrocardiac depressions curving inward light-colored. Eyestalks cream-buff, corneae dark bay. Under parts whiter than upper. Fingers white near tips; a small spot of bister on each finger. Dactyls of ambulatories vandyke brown, fading out to russet toward upper end; extreme tip buff. (W. L. Schmitt.)

Measurements.—Male (68205), entire length of carapace 136.8, width 162 mm.

Range.—Off Nova Scotia to Brazil; 22 to 1,178 fathoms.

Material examined.—See table 87, page 266.



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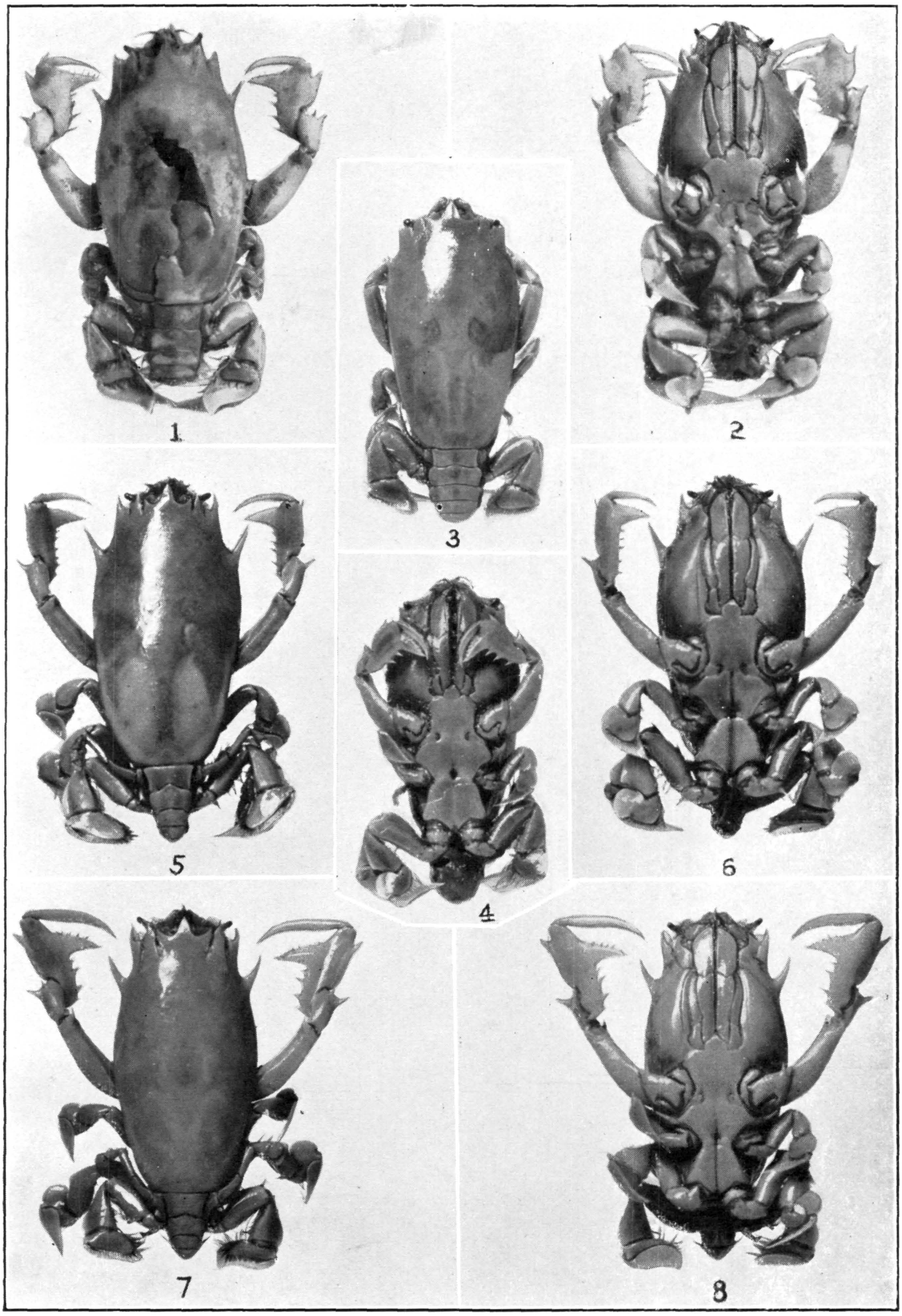
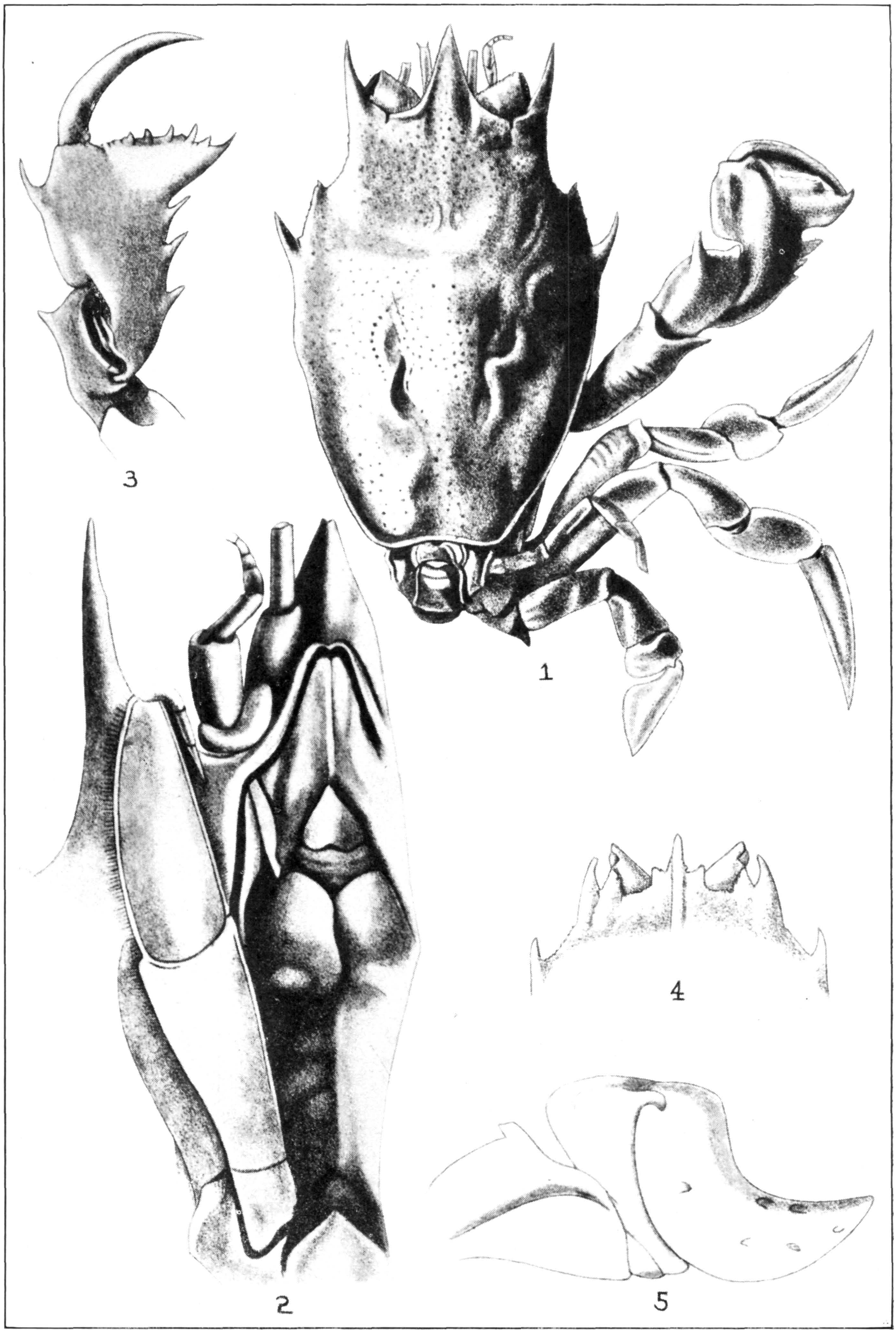


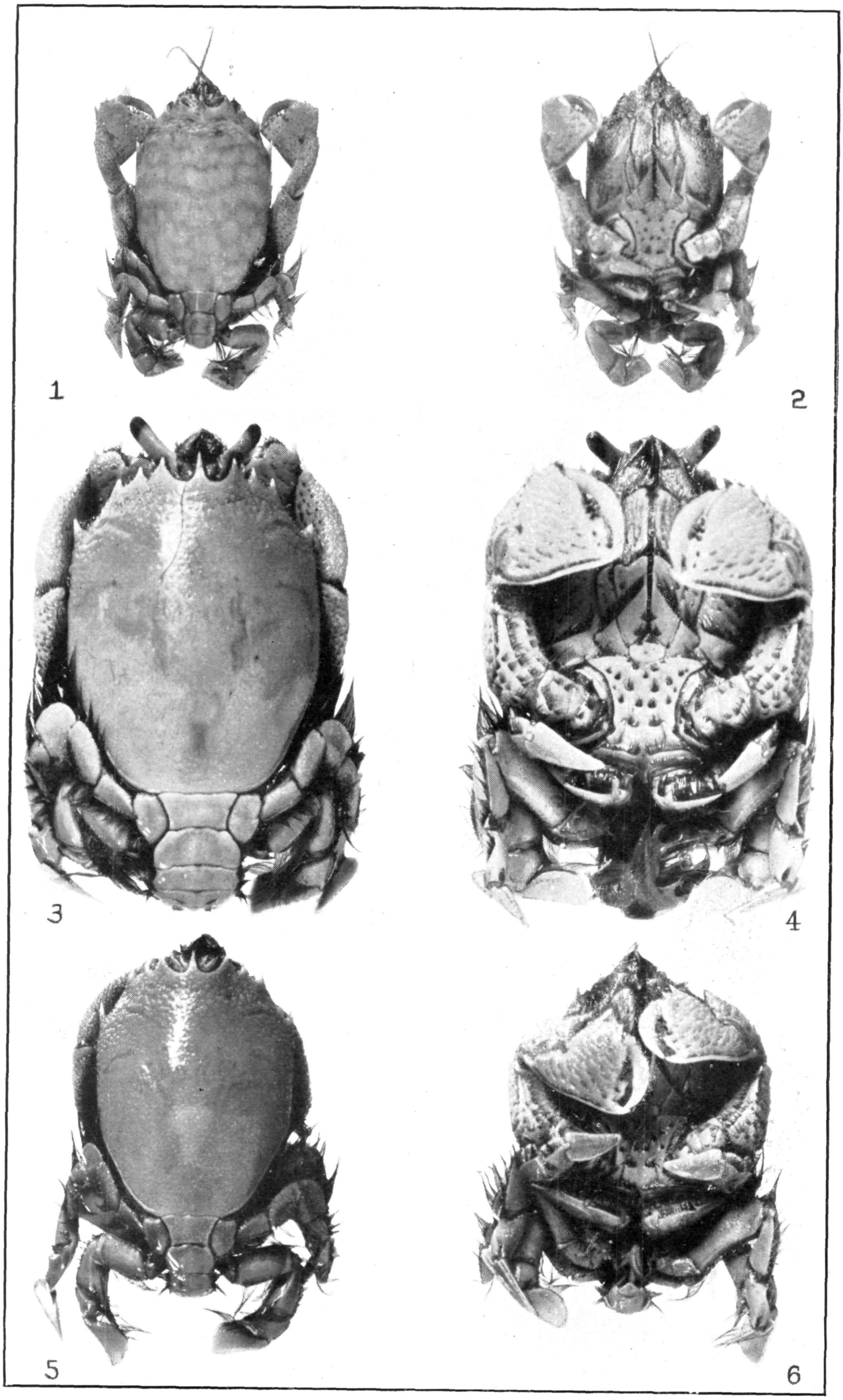
SPECIES OF RANINOIDES.

1, *R. laevis*, female (22560), natural size, dorsal view; 2, same, ventral view; 3, *R. lamarcki*, female (7754), natural size, dorsal view; 4, same, ventral view; 5, *R. louisianensis*, male holotype (9659), natural size, dorsal view; 6, same, ventral view; 7, *R. benedicti*, male holotype (57685), natural size, dorsal view; 8, same, ventral view.



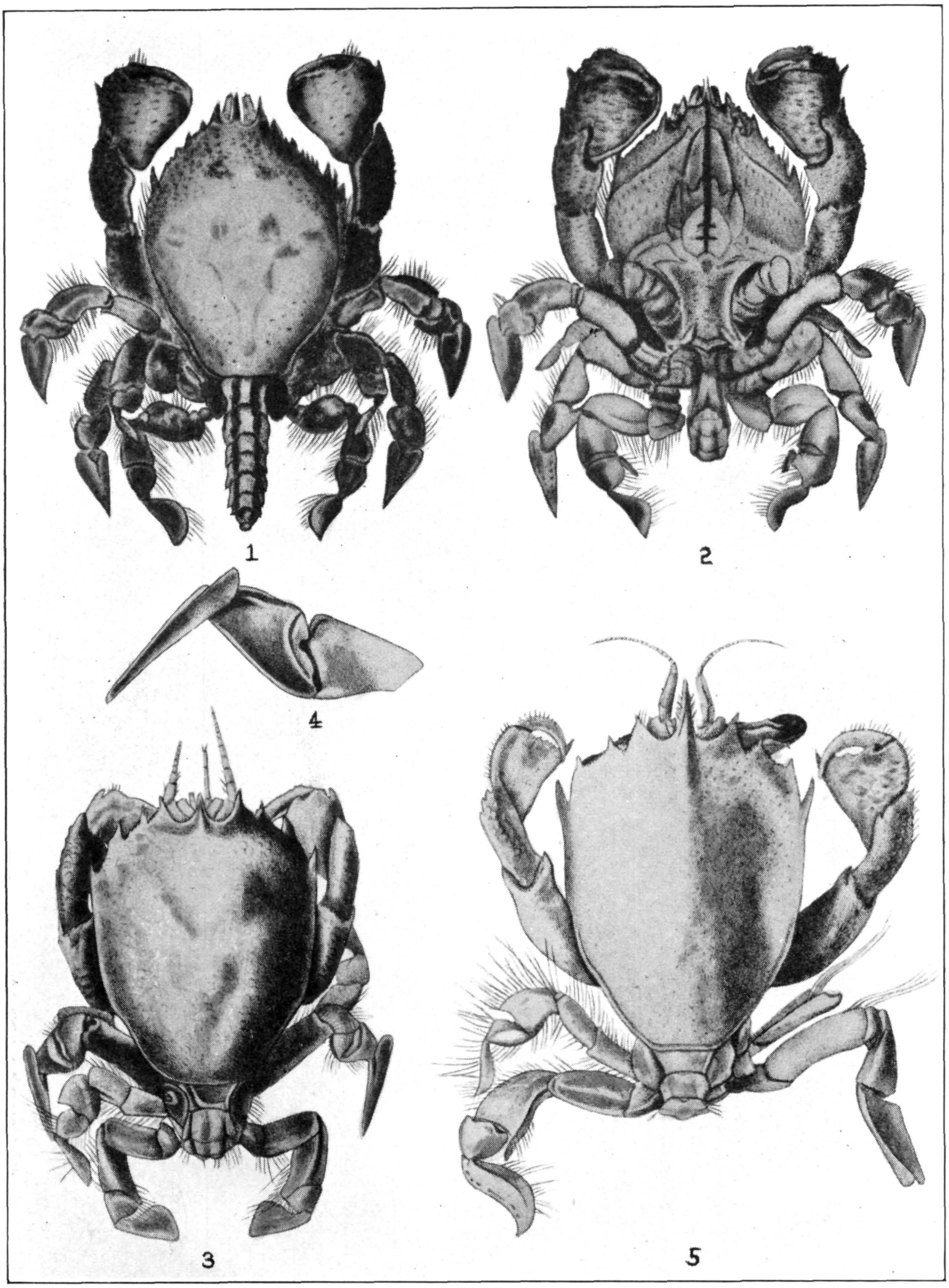
SPECIES OF RANINOIDES.

1, *R. nitidus*, male holotype, 8 mm long, × 7, dorsal view; 2, same, right frontobuccal region with appendages, × 22; 3, *R. fossor*, type, right chela and carpus, outer face, × 7; 4, same, anterior part of carapace and ocular peduncles, × 3, dorsal view; 5, same, extremity of second ambulatory foot, × 7. (After A. Milne Edwards and Bouvier.)



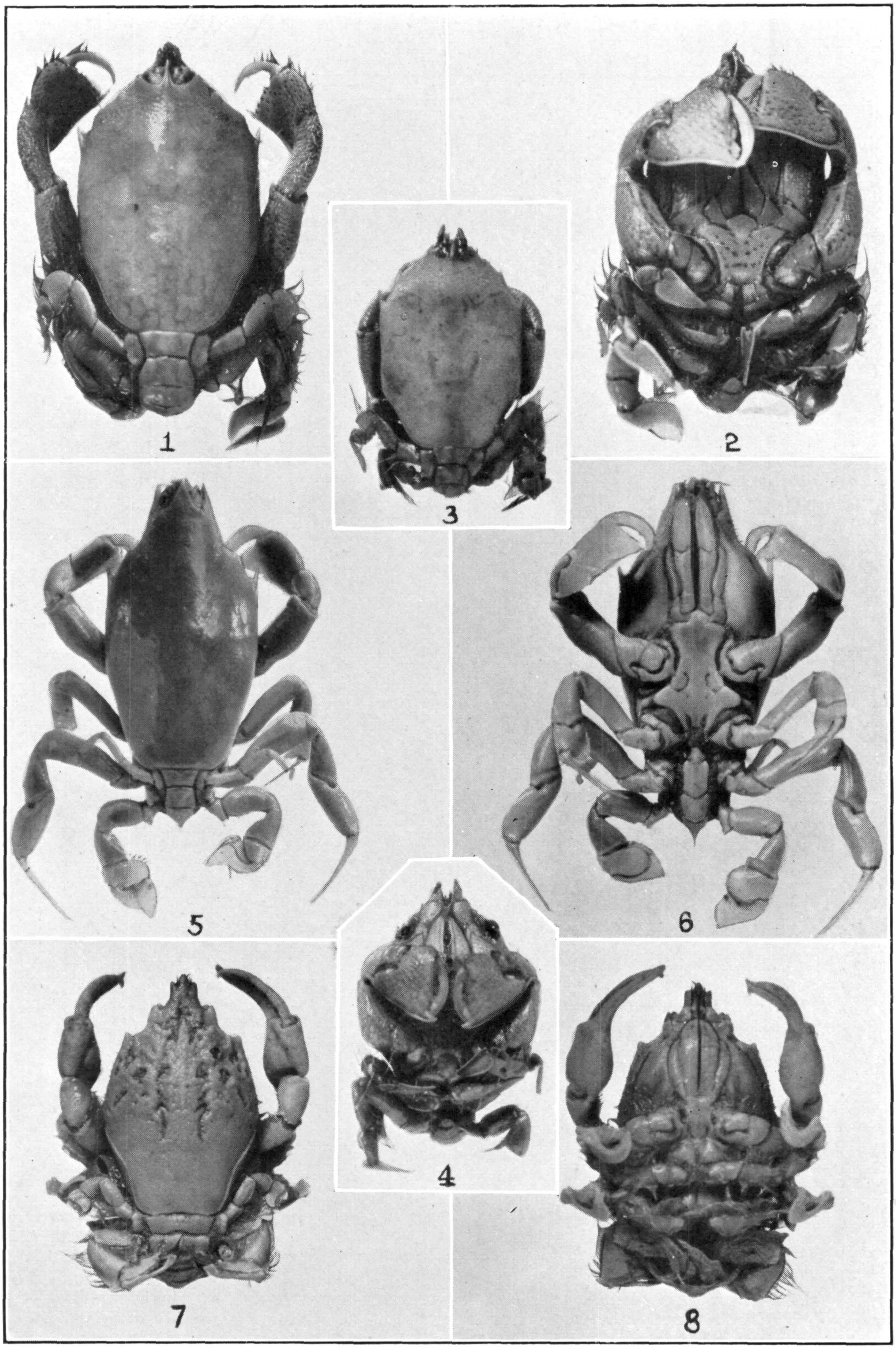
SPECIES OF RANILIA.

1, *R. angustata*, male (Glassell collection), × 2, dorsal view; 2, same, ventral view; 3, *R. muricata*, female (29001), × 1½, dorsal view; 4, same, ventral view; 5, *R. muricata*, male (29001), × 1½, dorsal view; 6, same, ventral view.



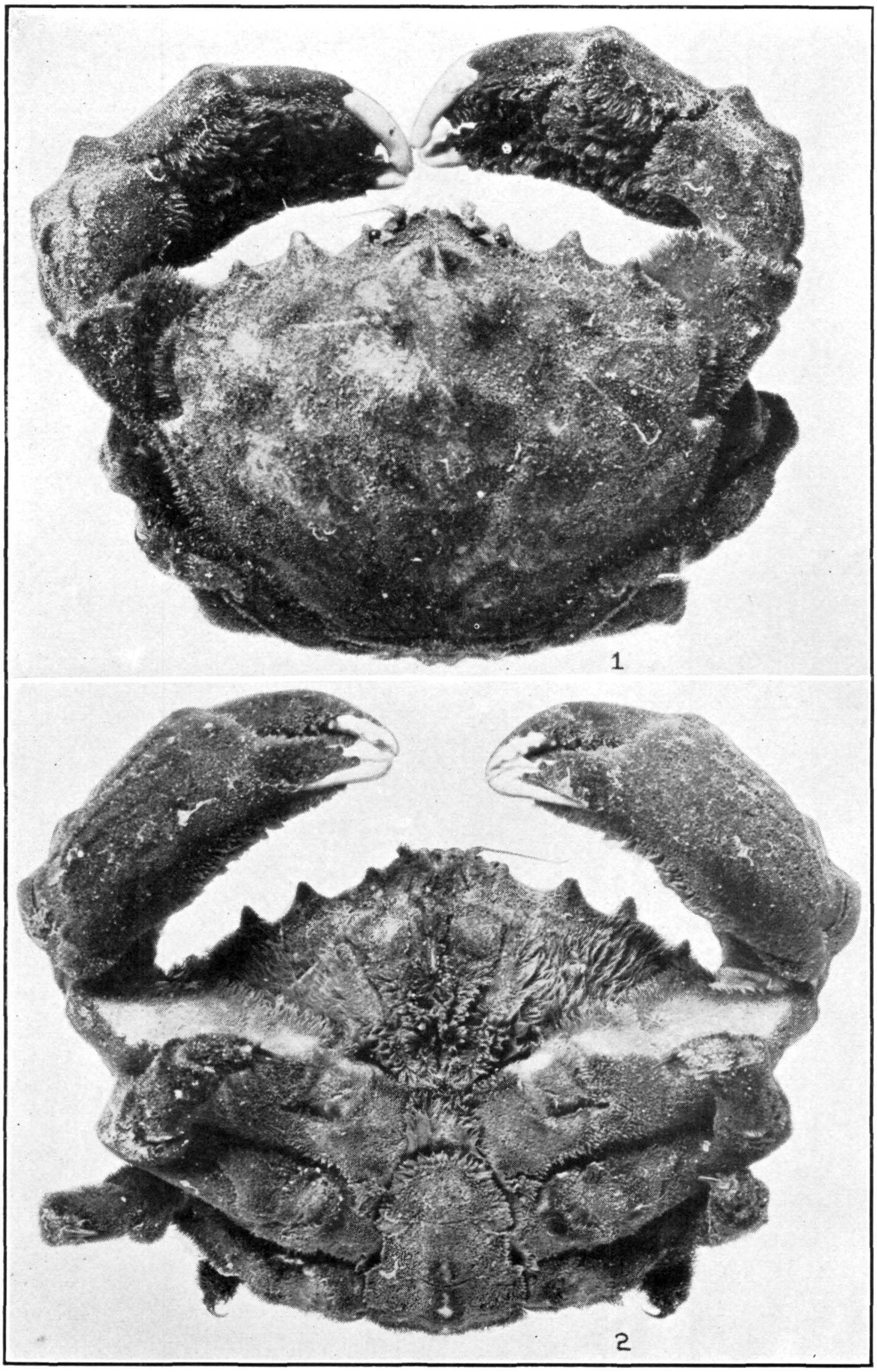
SPECIES OF RANILIA.

1, *R. muricata*, male, about two-thirds natural size, dorsal view (after Gibbes); 2, same, ventral view; 3, *R. muricata*, female, type of *R. stimpsoni*, × 2½ (approximately), dorsal view (after A. Milne Edwards and Bouvier); 4, same, extremity of second left ambulatory leg, × 5 (approximately); 5, *R. constricta*, male type, × 2⅘ (approximately), dorsal view (after A. Milne Edwards and Bouvier).



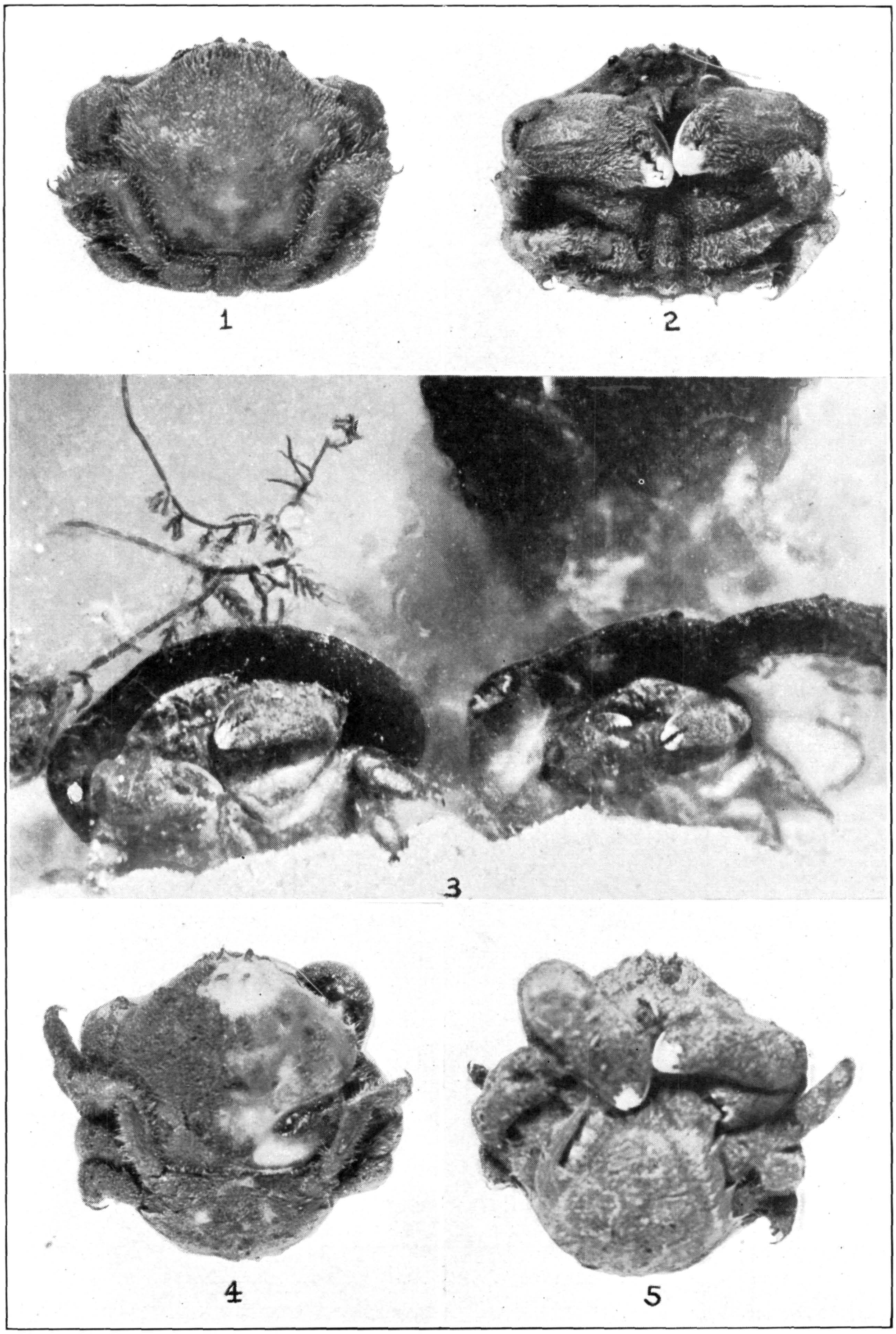
SPECIES OF RANILIA, LYREIDUS, AND SYMETHIS.

1, *Ranilia constricta*, female (48642), × 1½ dorsal view; 2, same, ventral view; 3, *R. fornicata*, male (21710), × 2, dorsal view; 4, same, ventral view; 5, *Lyreidus bairdii*, male (66639), natural size, dorsal view; 6, same, ventral view; 7, *Symethis variolosa*, female (47973), × 1½, dorsal view; 8, same, ventral view.



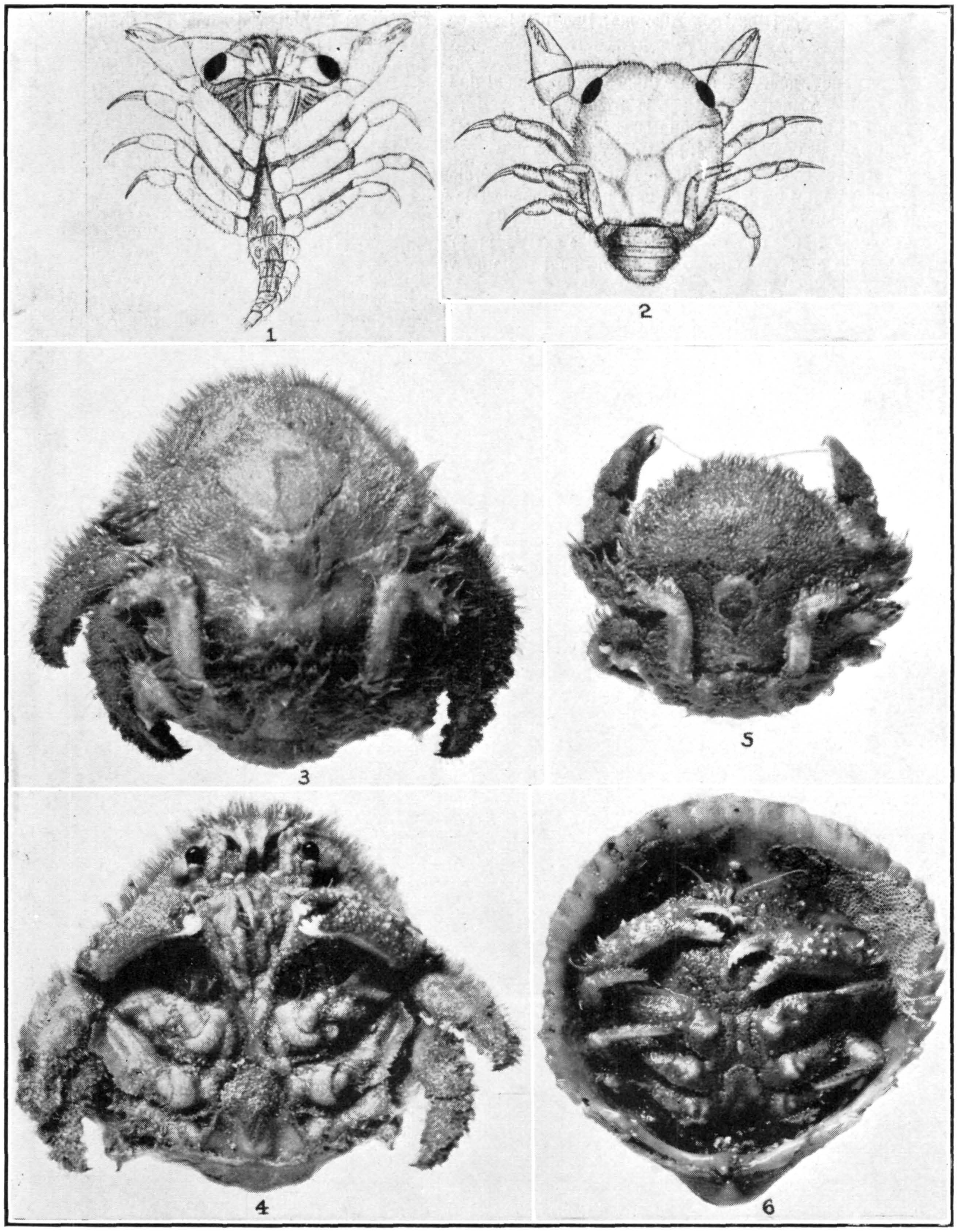
DROMIA ERYTHROPUS.

1, Male (2197), two-fifths natural size, dorsal view; 2, same, ventral view.



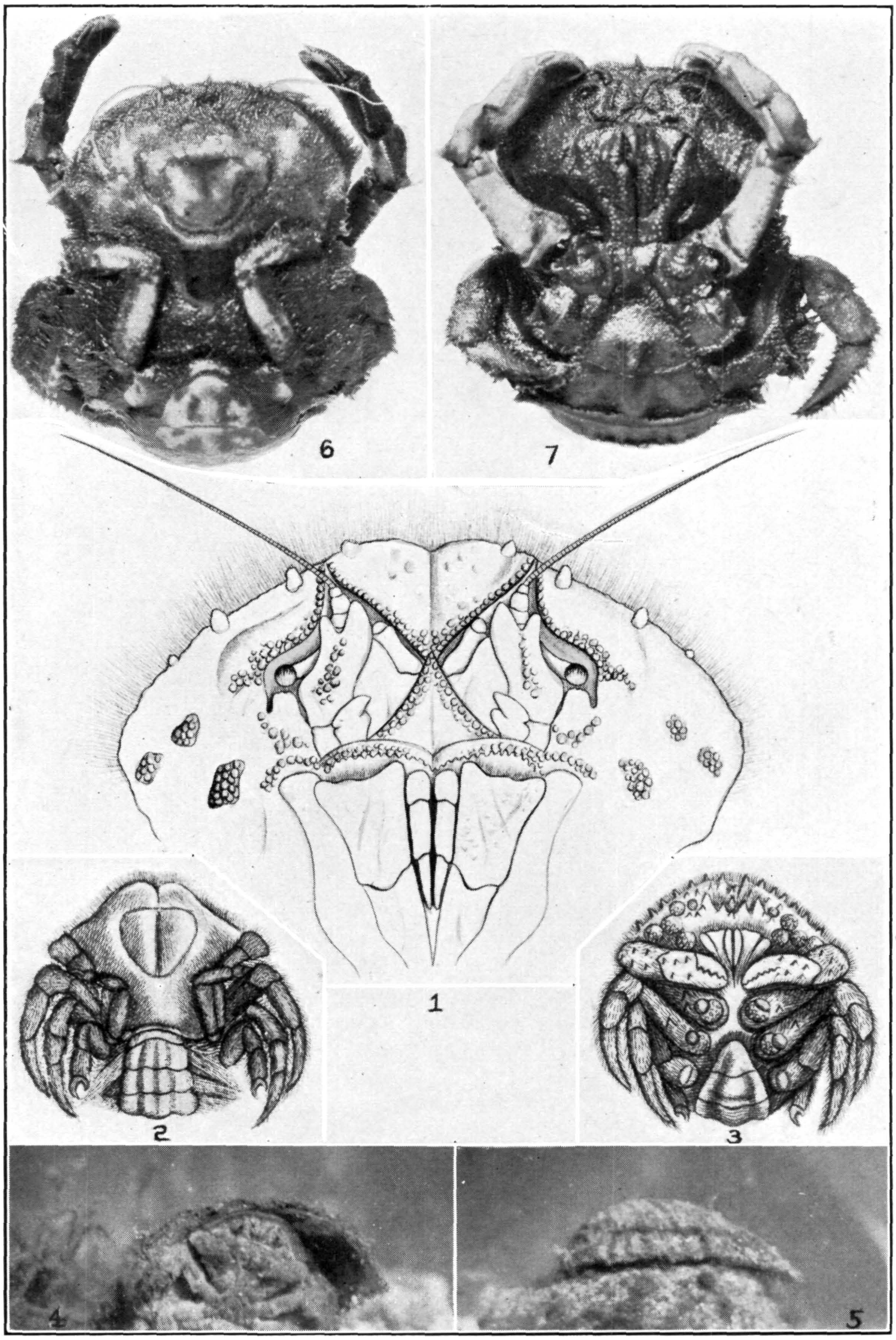
SPECIES OF DROMIDIA.

1, *D. antillensis*, male (42913), natural size, dorsal view; 2, same, ventral view; 3, photograph of same species taken in aquarium at Tortugas, Fla.; 4, *D. larraburei*, female (40475), natural size, dorsal view; 5, same, ventral view.



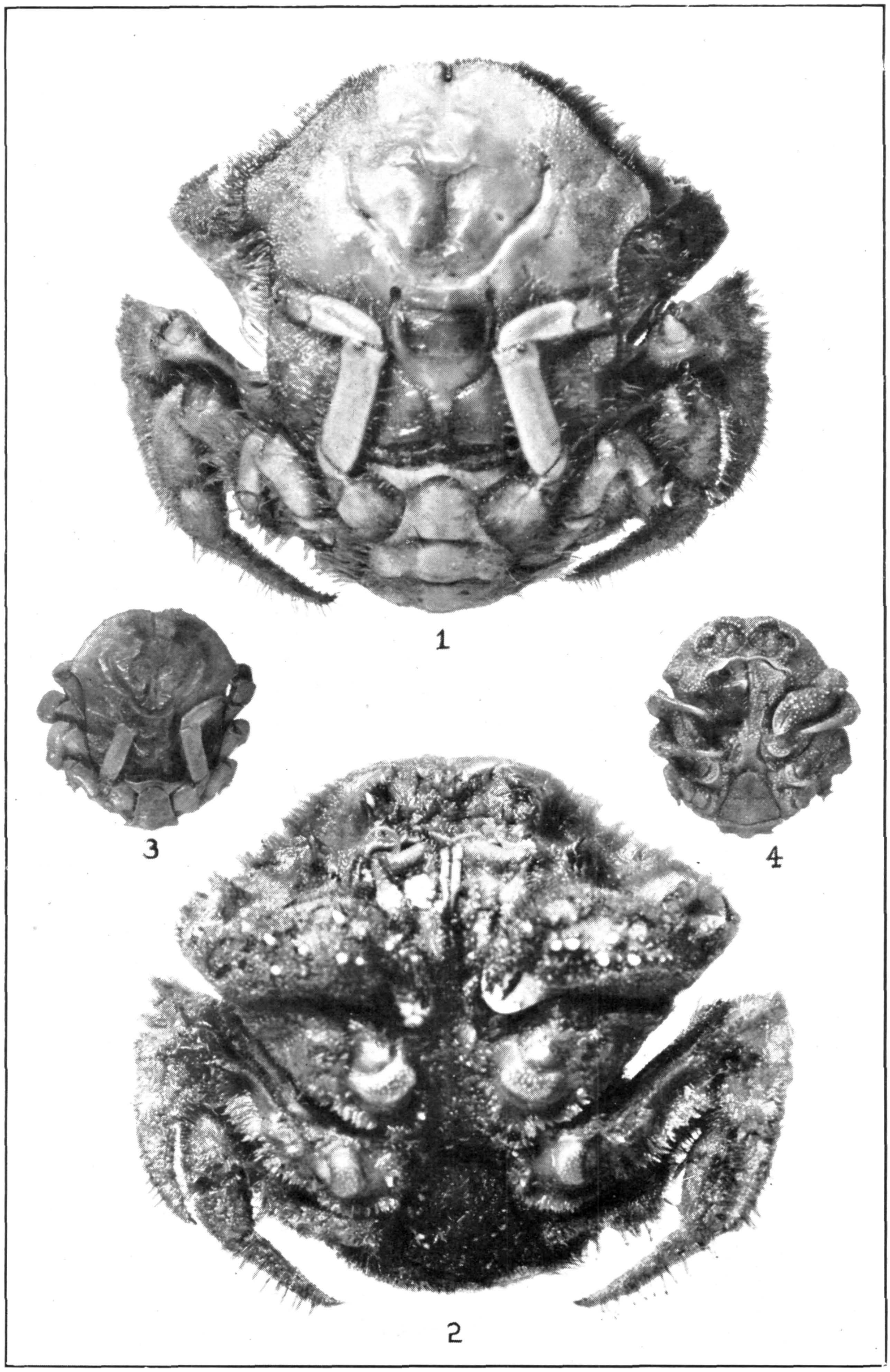
SPECIES OF HYPOCONCHA AND LARVAL DROMID, EVIUS.

1, *Evius ruber*, male, × 2⅘ (approximately), ventral view (after Moreira); 2, same, dorsal view; 3, *Hypoconcha sabulosa*, male (66796), × 1⅔ (approximately), dorsal view; 4, same, ventral view; 5, *H. lowei*, female holotype (67575), × 1⅔ (approximately), dorsal view; 6, same, ventral view.



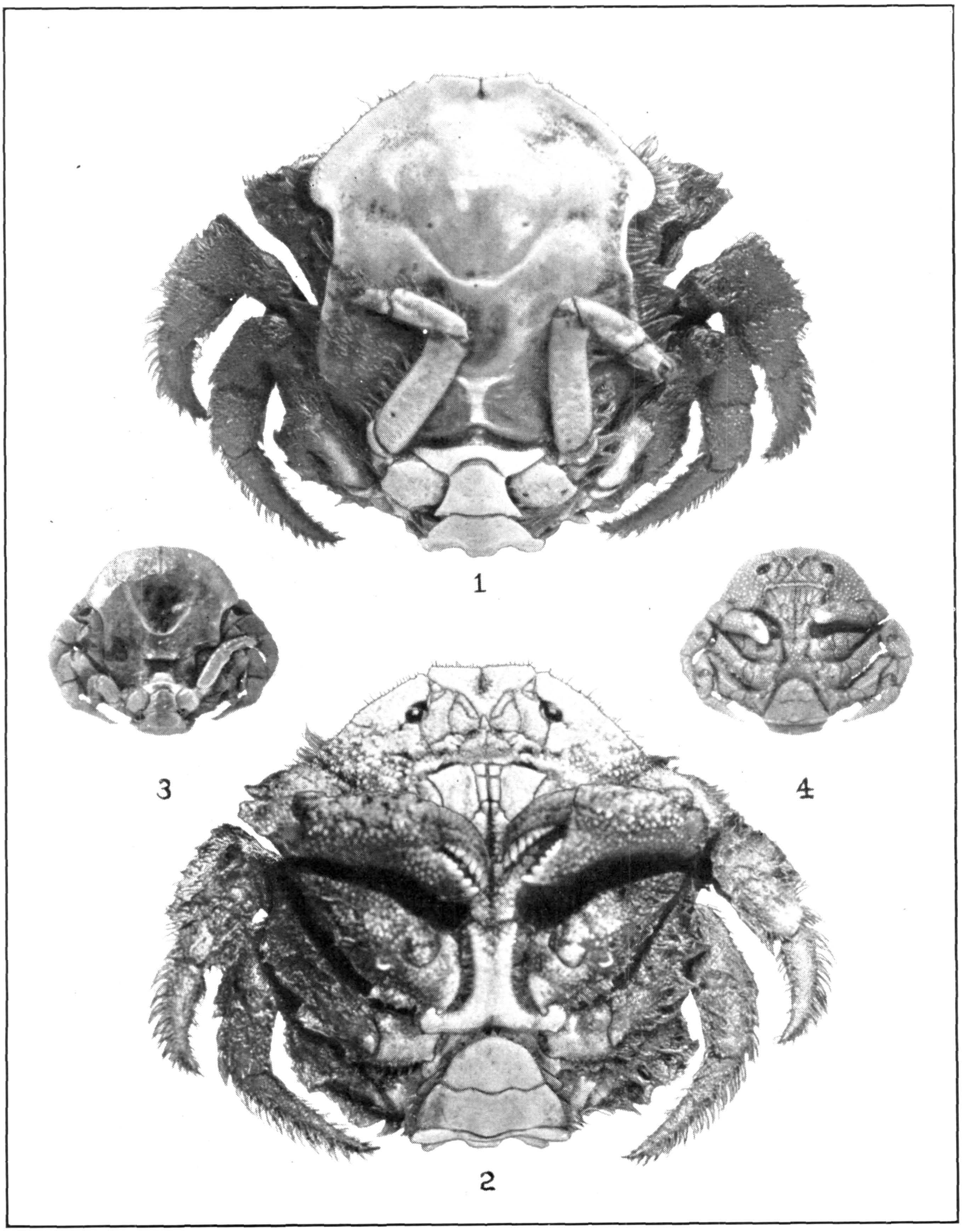
SPECIES OF HYPOCONCHA.

1, *H. sabulosa*, ventral view of anterior part (after La Sagra and Guérin); 2, same species, female, five-sixths natural size, dorsal view (after Herbst); 3, same, ventral view; 4, same species, male (66796) in its natural habitat; 5, same, underneath bivalve shell; 6, *H. panamensis*, female (40474), × 1⅔, dorsal view; 7, same, ventral view.



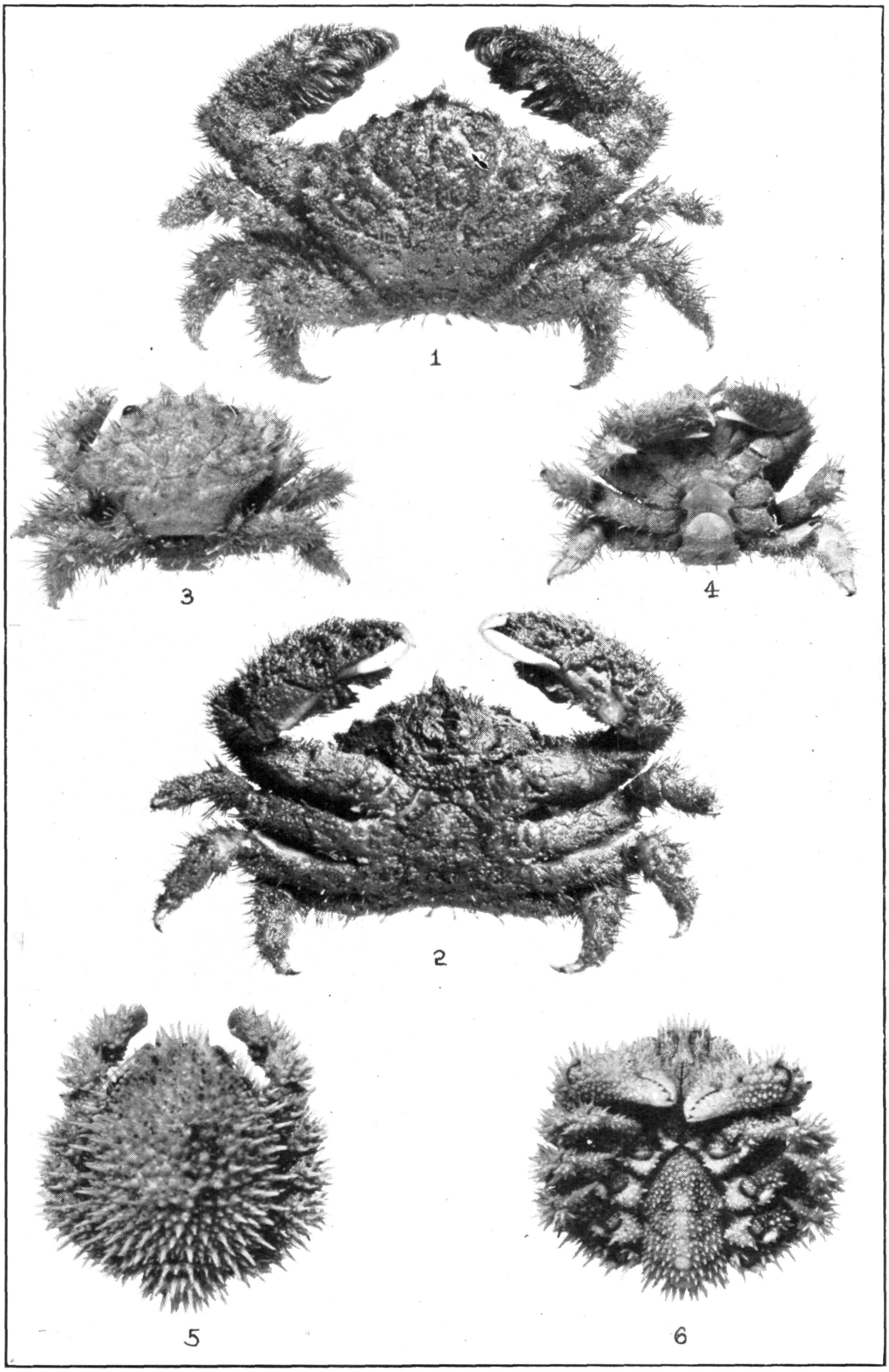
SPECIES OF HYPOCONCHA.

1, *H. spinosissima*, male (66793), × 2, dorsal view; 2, same, ventral view; 3, *H. californiensis*, male (42224), × 3, dorsal view; 4, same, ventral view.



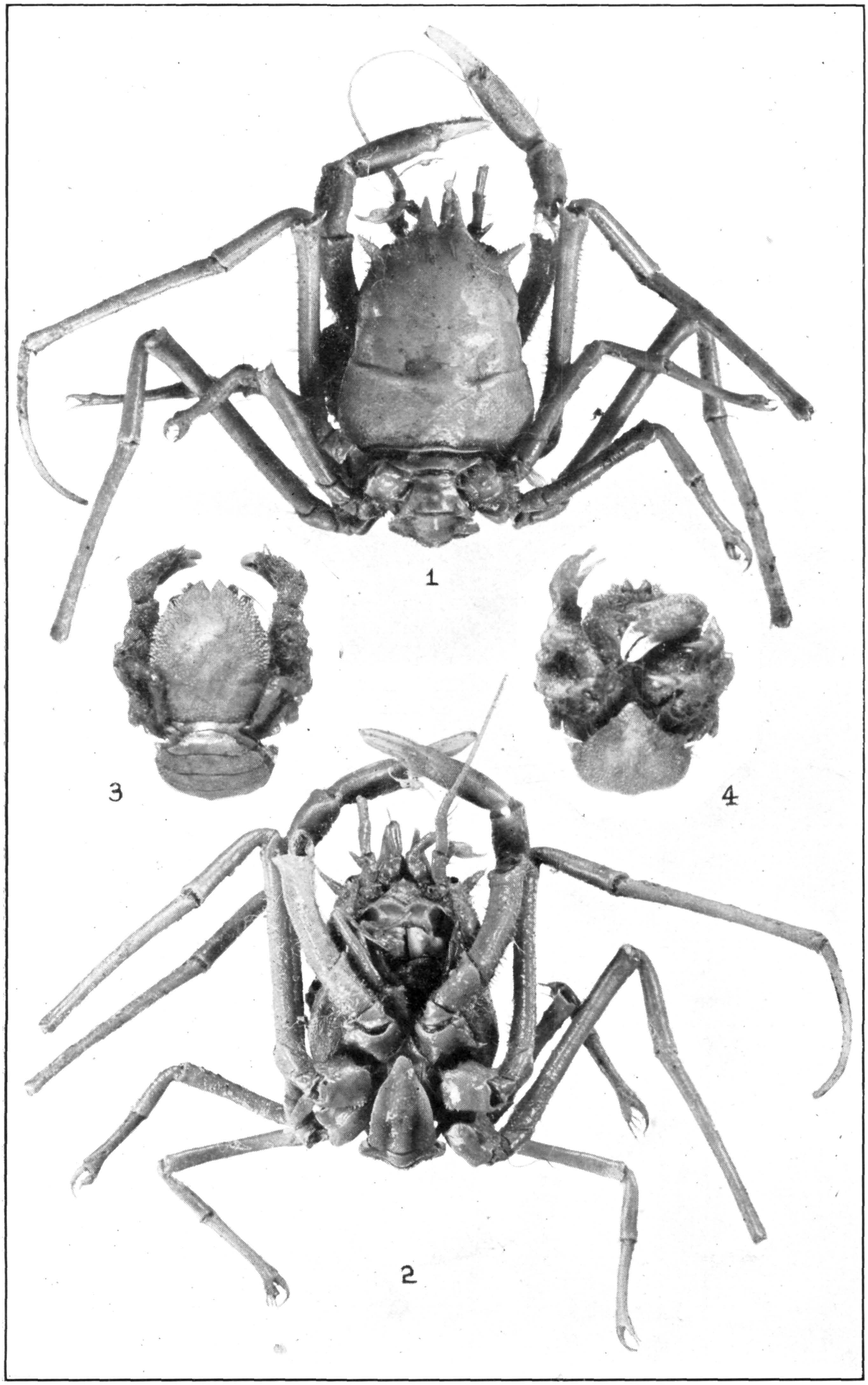
HYPOCONCHA ARCUATA.

1, Male (67862), carapace 23.6 mm long, dorsal view; 2, same, ventral view; 3, male (42222), × 2, dorsal view; 4, same, ventral view.



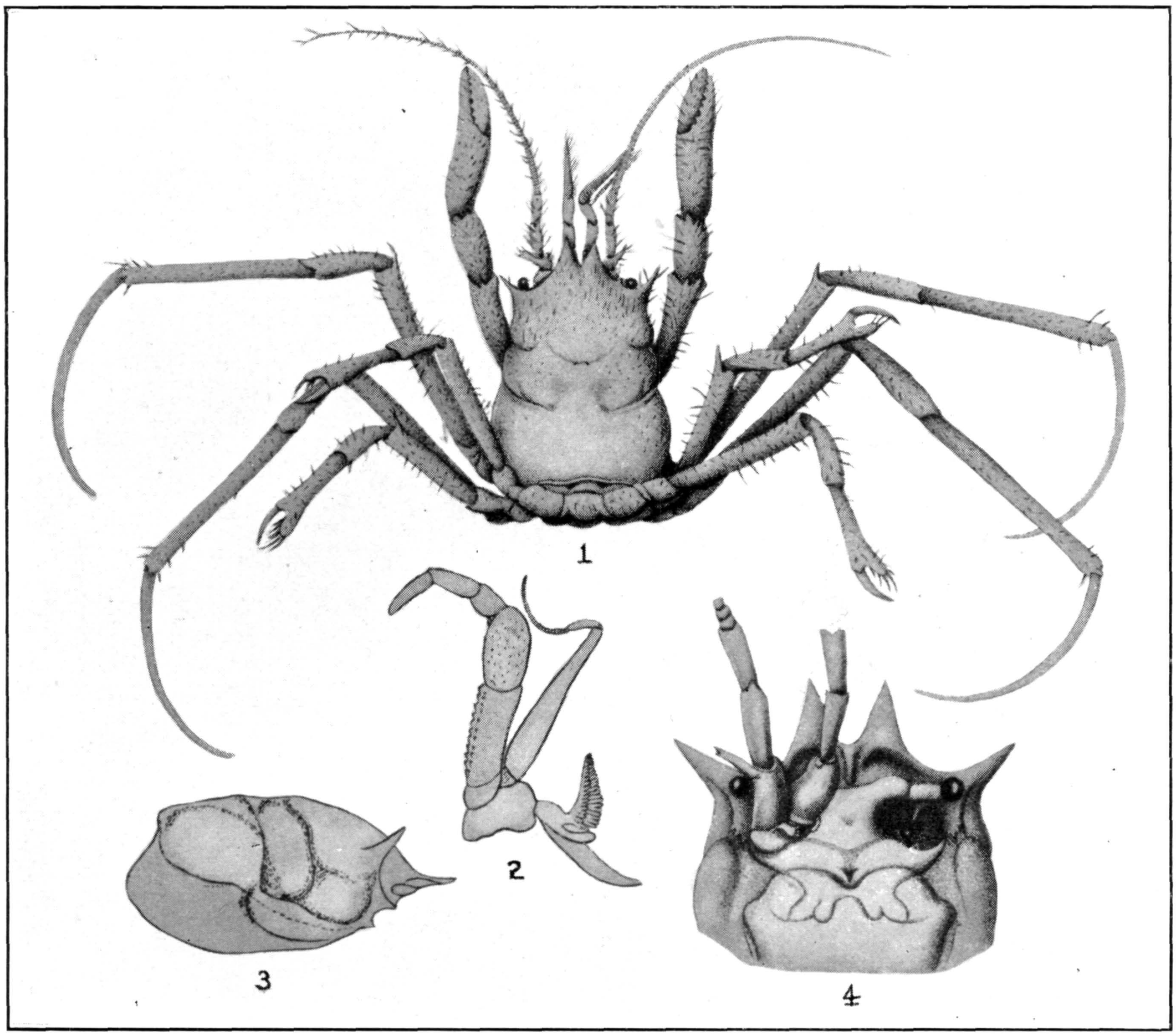
DYNOMENE URSULA AND ACANTHODROMIA ERINACEA.

1, *Dynomene ursula*, male (68316), × 1⅕, dorsal view; 2, same, ventral view; 3, same species, male (61519), × 2⅖, dorsal view; 4, same, ventral view; 5, *Acanthodromia erinacea*, female (9547), × 2⅖, dorsal view; 6, same, ventral view.



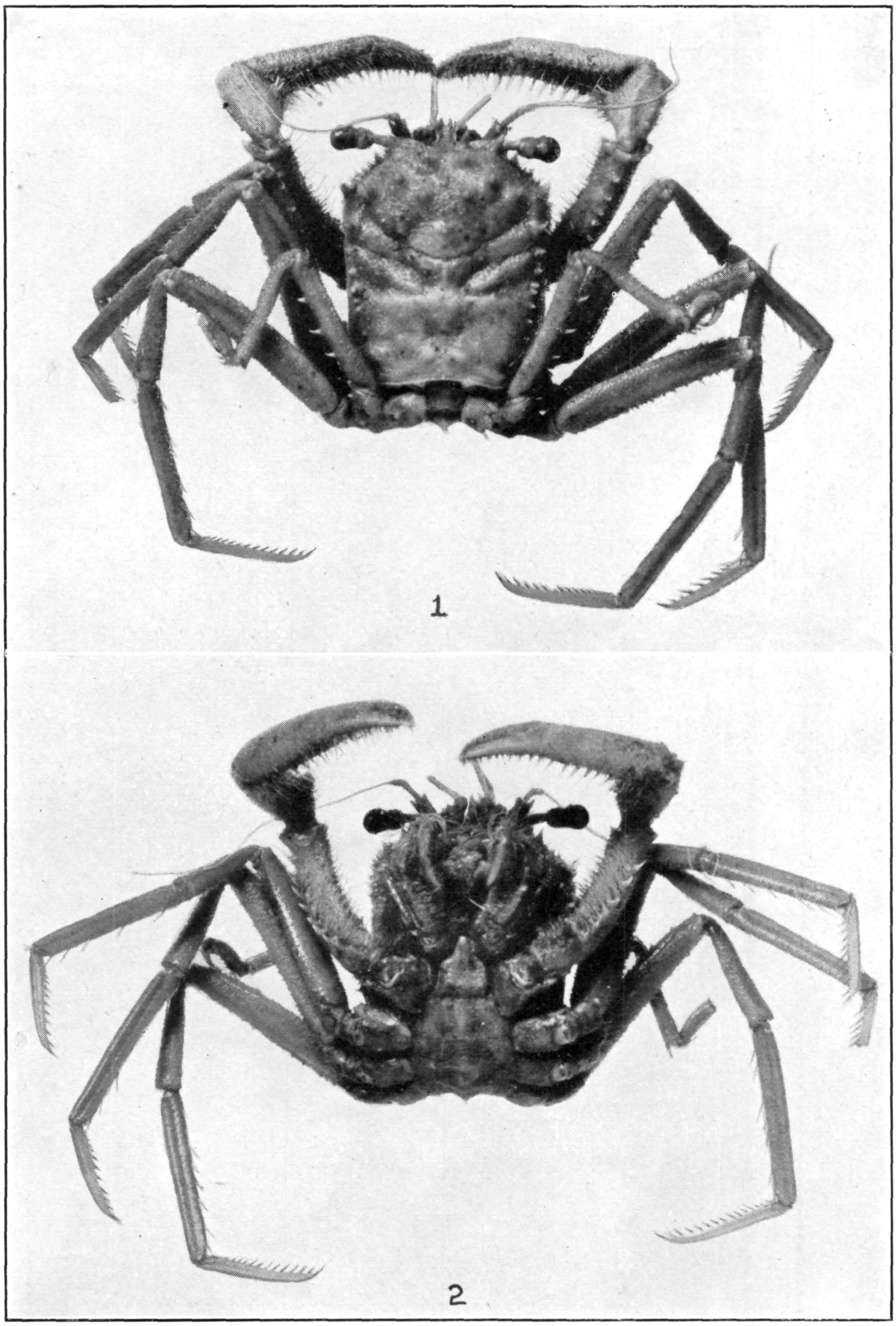
HOMOLODROMIA PARADOXA AND DICRANODROMIA OVATA.

1, *Homolodromia paradoxa*, male holotype (M. C. Z. no. 6512), × 2, dorsal view; 2, same, ventral view; 3, *Dicranodromia ovata*, female (57069), × 2, dorsal view; 4, same, ventral view.



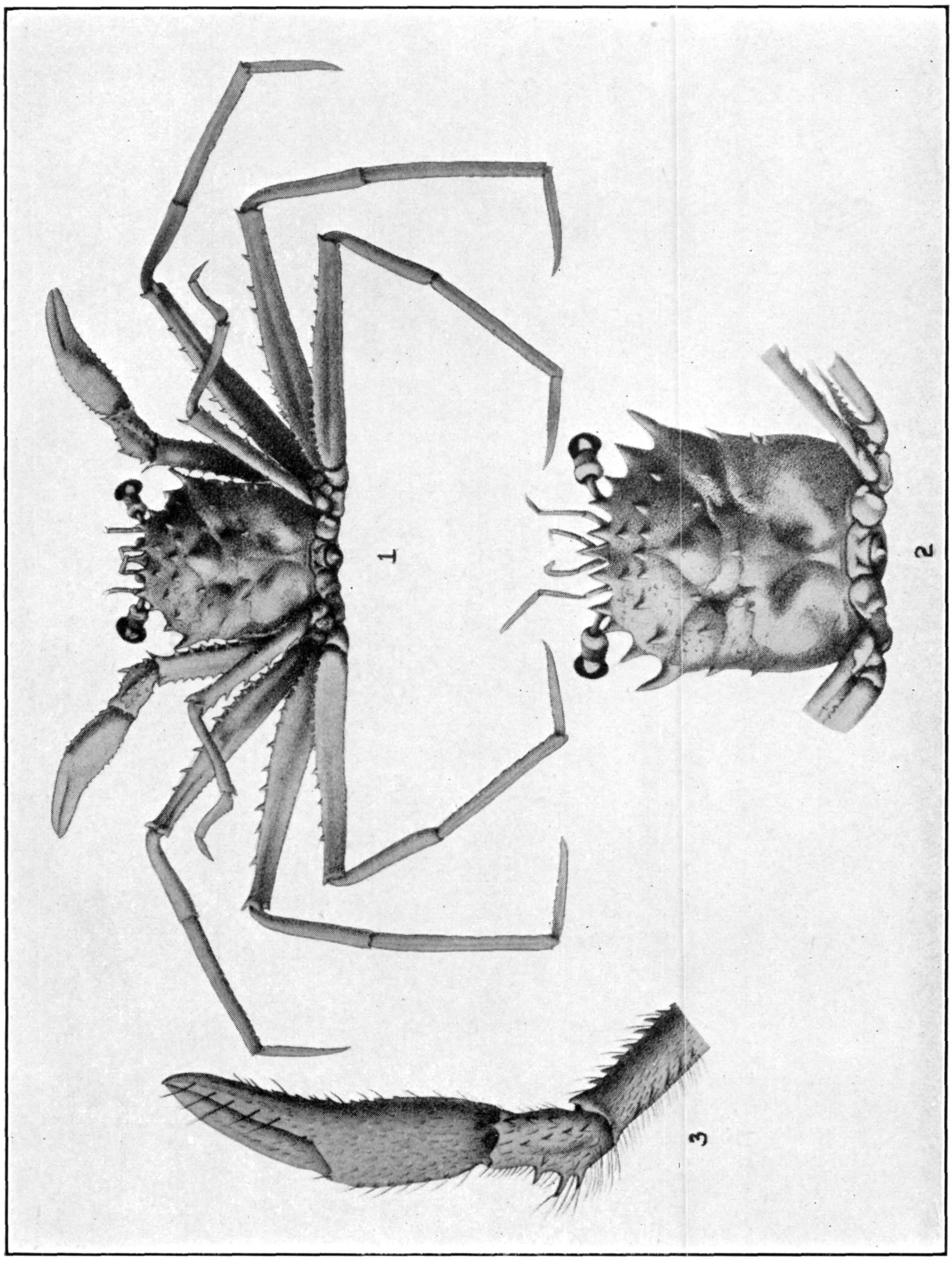
HOMOLODROMIA PARADOXA.

1, Male, × 1⅓, dorsal view (after A. Milne Edwards and Bouvier); 2, left outer maxilliped, enlarged (after Bouvier); 3, view of right side of carapace, enlarged (after Bouvier); 4, anterior part of ventral surface of specimen shown in fig. 1, with antennae, × 5⅗.



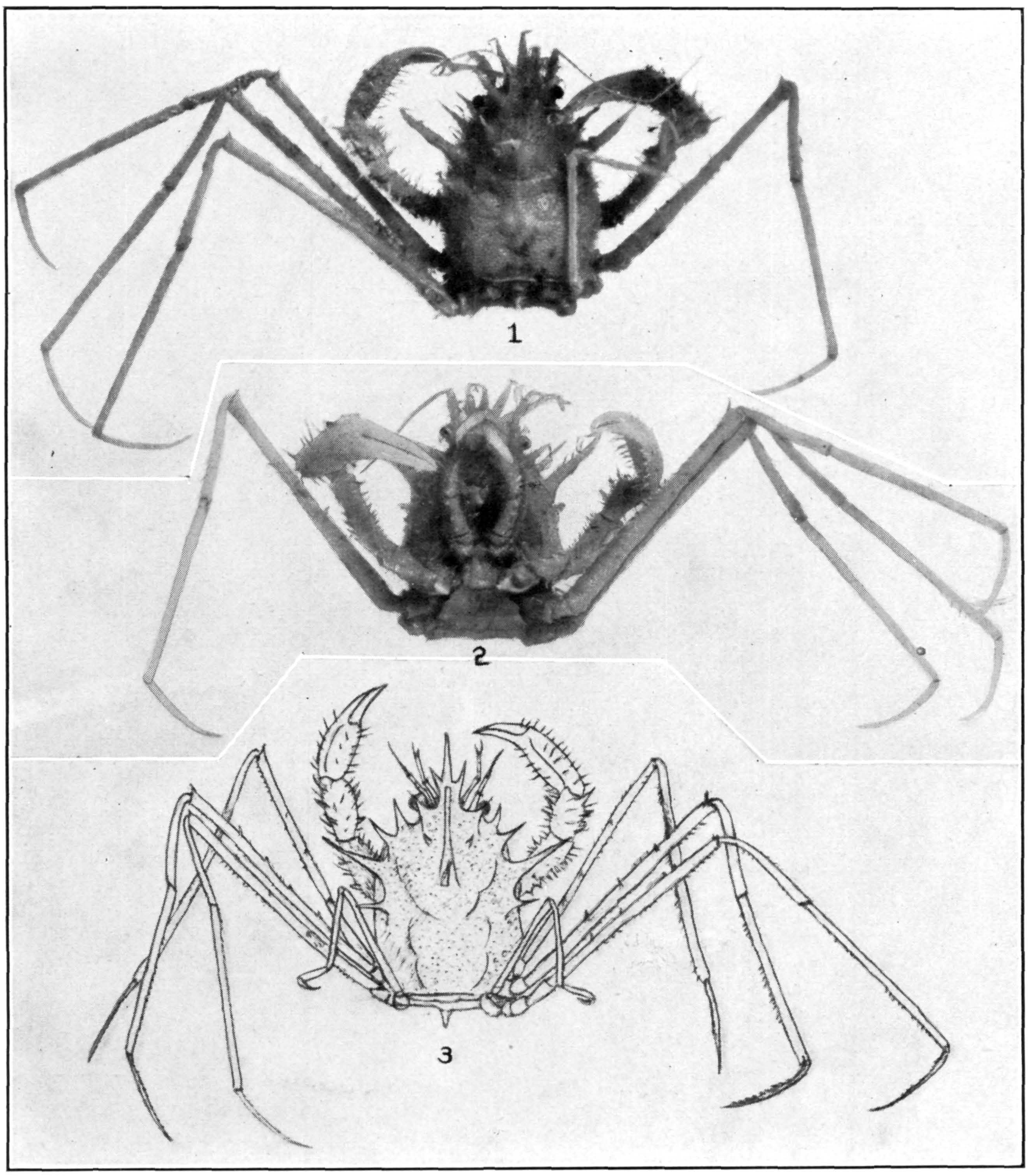
THELXIOPE BARBATA.

1, Male (23182), natural size, dorsal view; 2, same, ventral view.



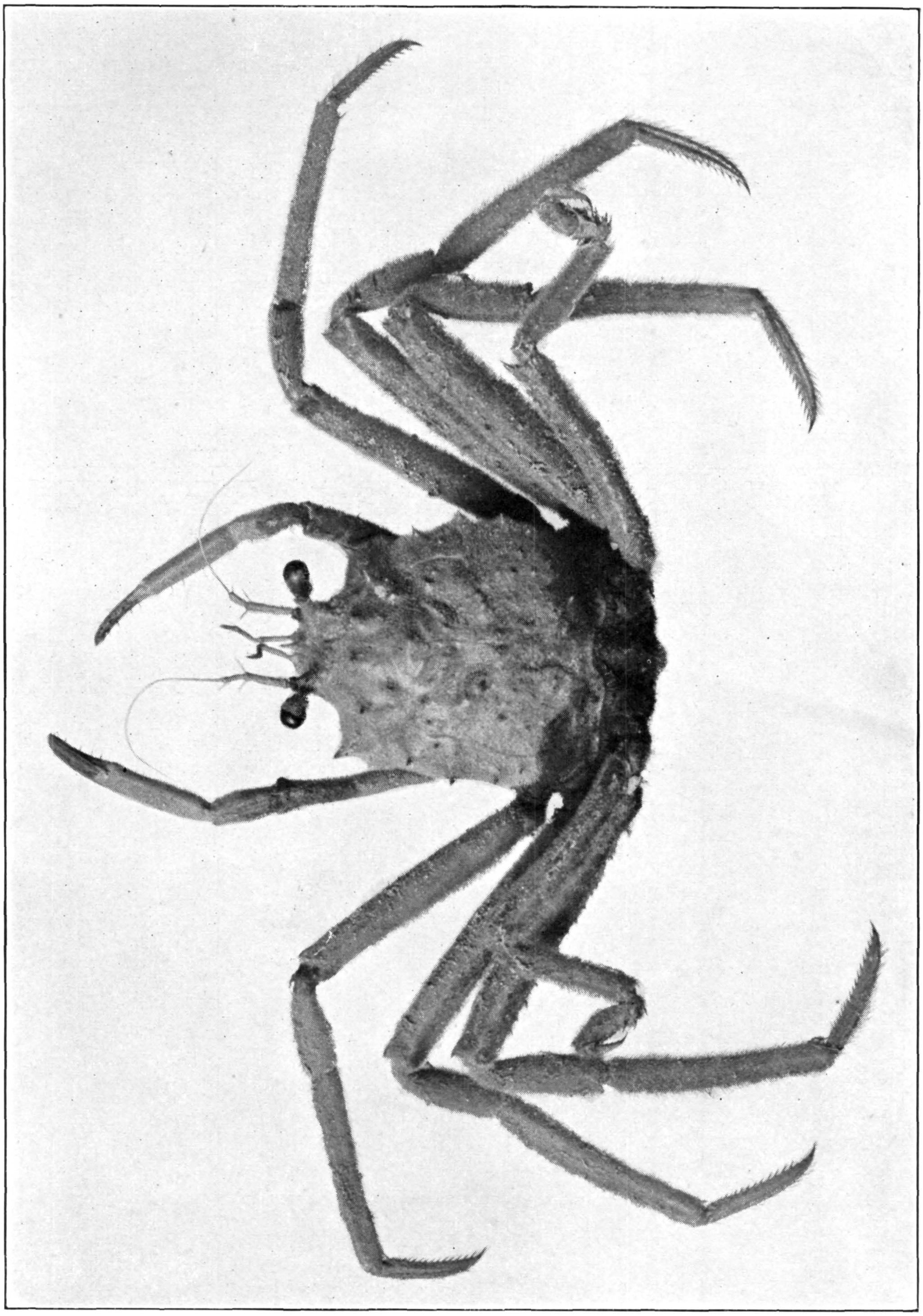
THELXIOPE VIGIL.

1, Male, about natural size, dorsal view; 2, same specimen, carapace and cephalic appendages enlarged, dorsal view; 3, right cheliped, outer face, × 2½ (approximately). (After A. Milne Edwards and Bouvier.)



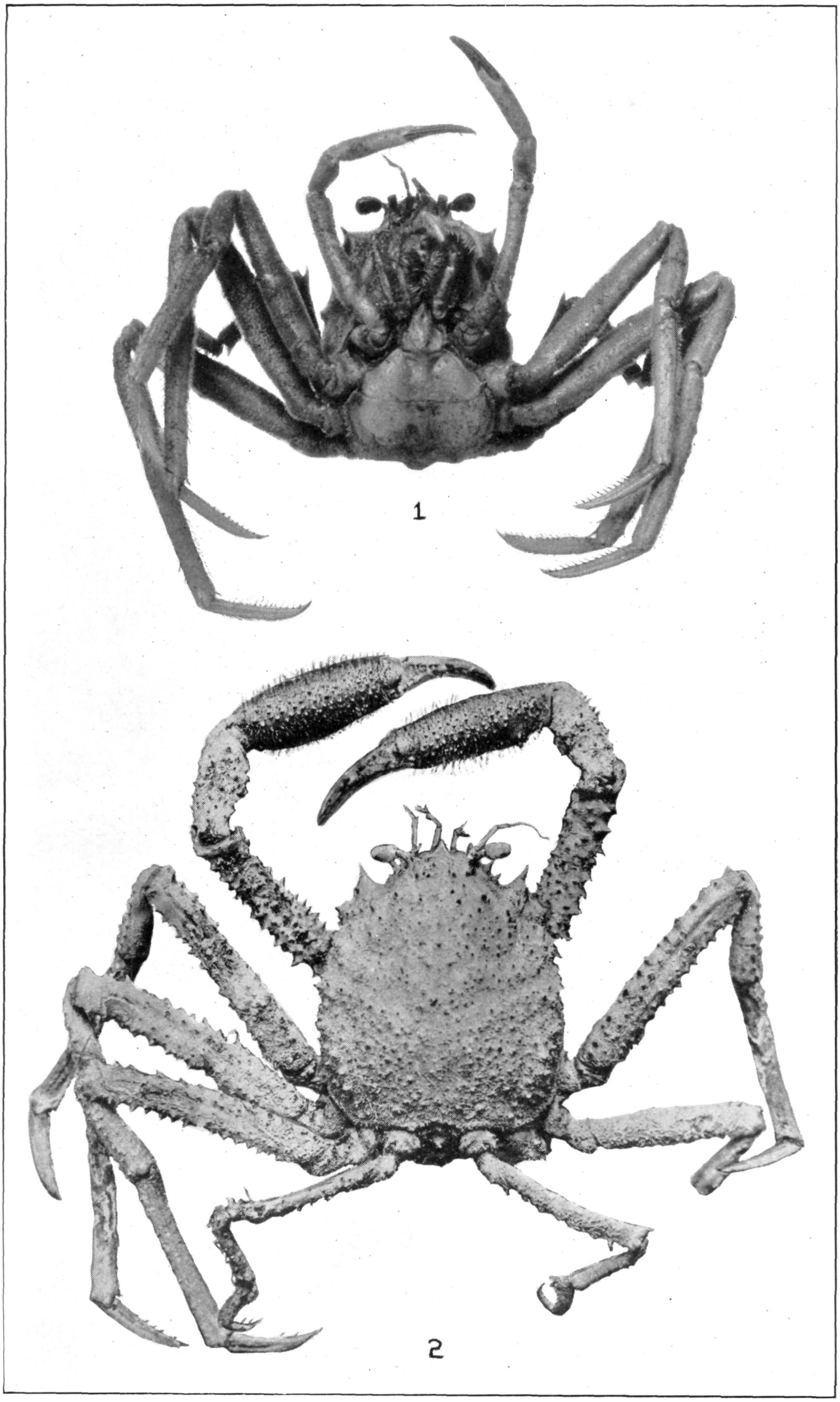
HOMOLOGENUS ROSTRATUS

1, Male (7802), × 2⅖, dorsal view; 2, same, ventral view; 3, dorsal view (after A. Milne Edwards).



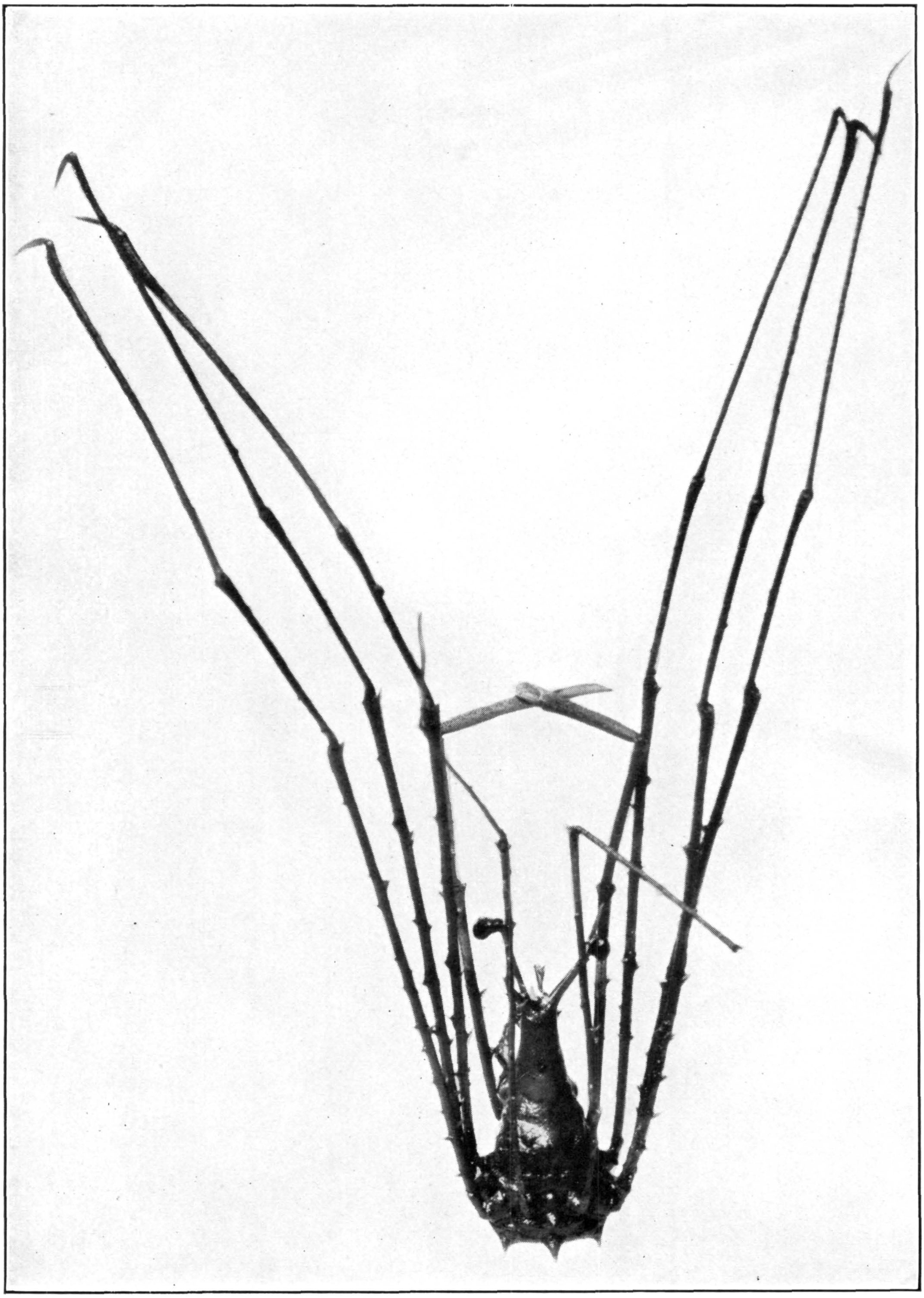
PAROMOLA FAXONI.

Female holotype (53331), carapace 45 mm long, dorsal view.



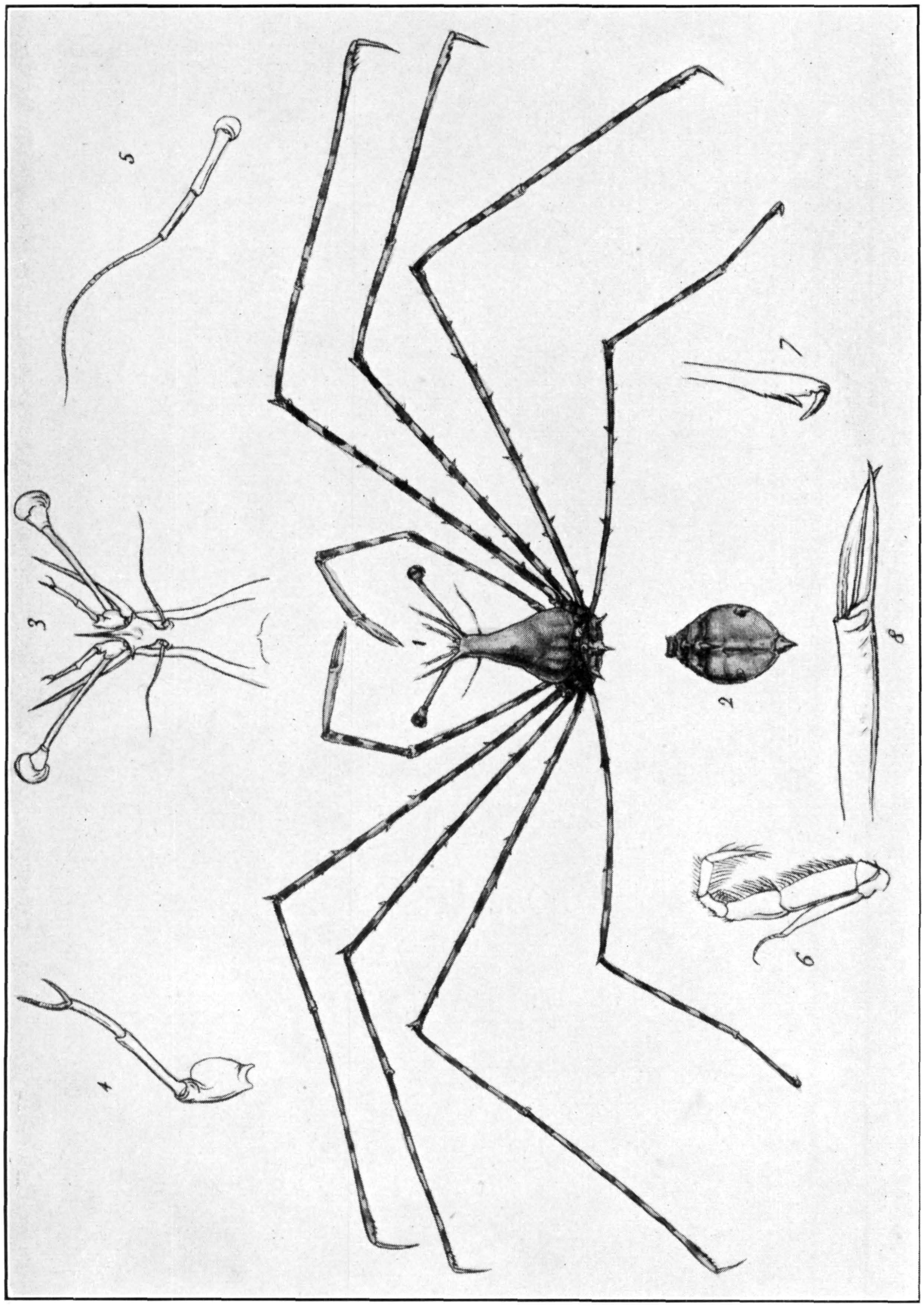
SPECIES OF PAROMOLA.

1, *P. faxoni*, female holotype (53331), carapace 45 mm long, ventral view; 2, *P. rathbuni*, male, Juan Fernandez, carapace 109 mm long, dorsal view.



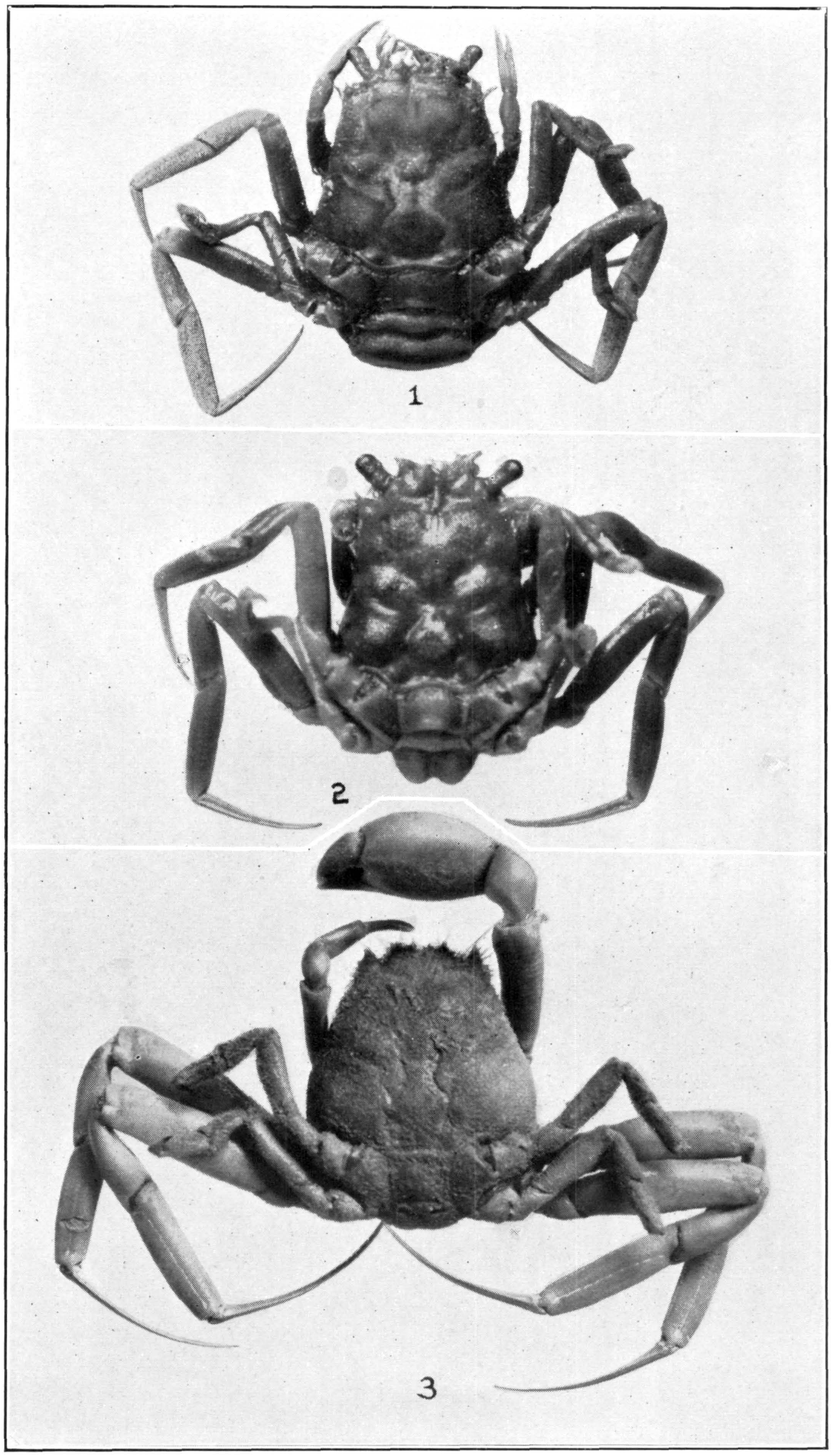
LATREILLIA ELEGANS.

Female (8044), × 2, dorsal view.



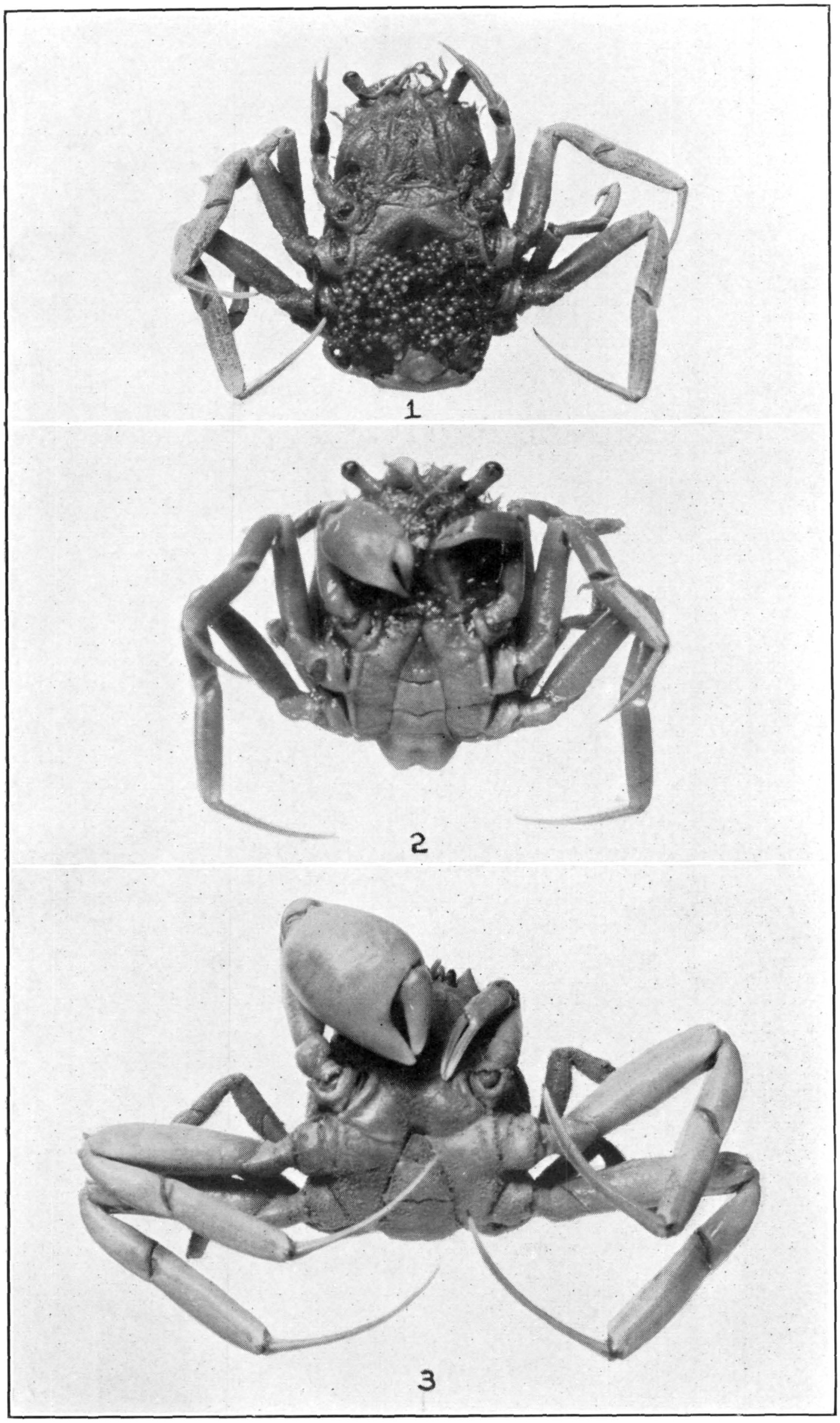
LATREILLIA ELEGANS.

Female (after Roux): 1, Dorsal view; 2, abdomen; 3, anterior part of carapace and appendages, ventral view; 4, antennule; 5, antenna; 6, outer maxilliped; 7, extremity of fourth ambulatory leg; 8, chela.



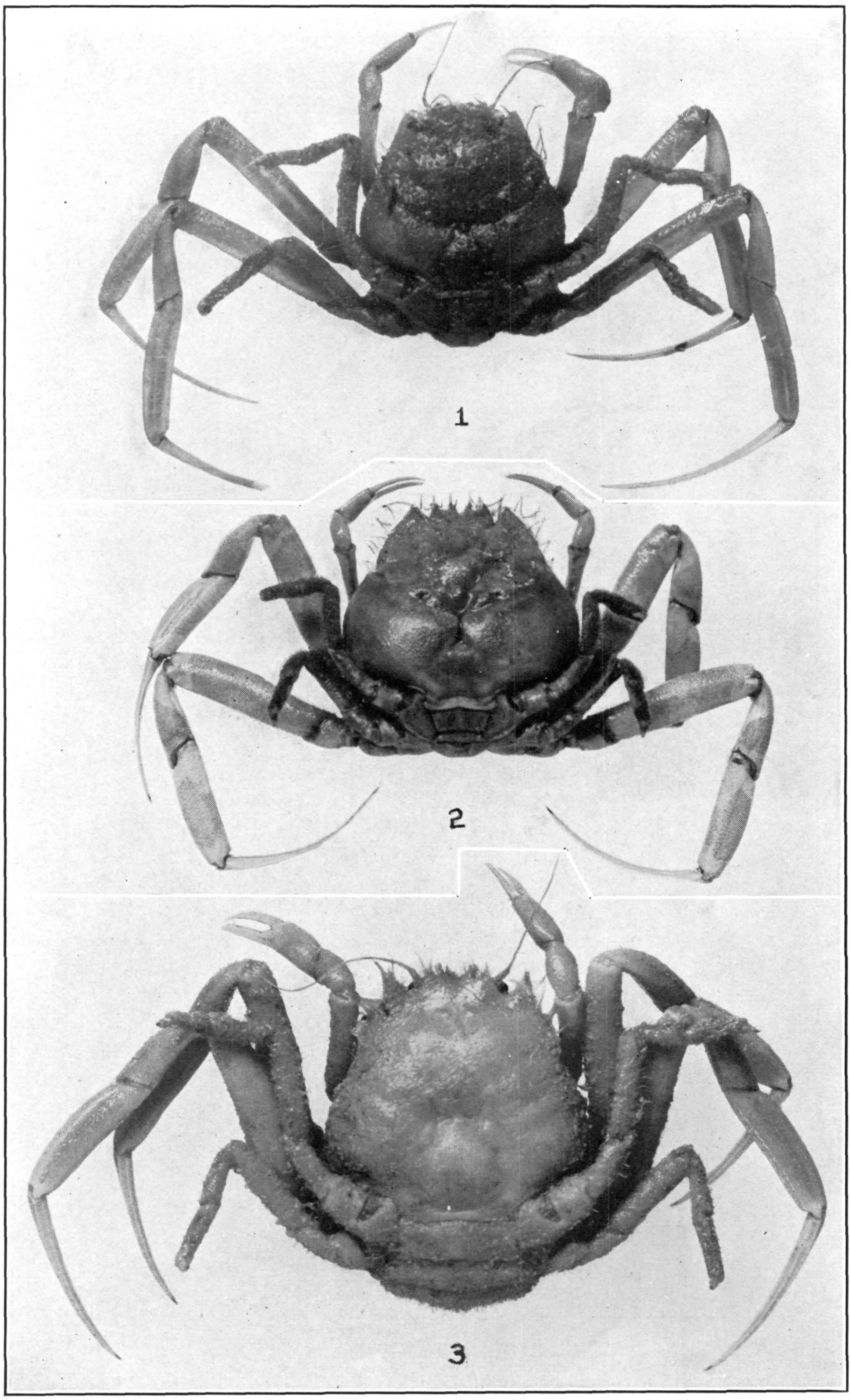
SPECIES OF ETHUSA.

1, *E. mascarone panamensis*, ovigerous female (66797), × 2½, dorsal view; 2, *E. m. americana*, male, Tiburon Island, × 3, dorsal view; 3, *E. microphthalma*, male (66829), natural size, dorsal view.



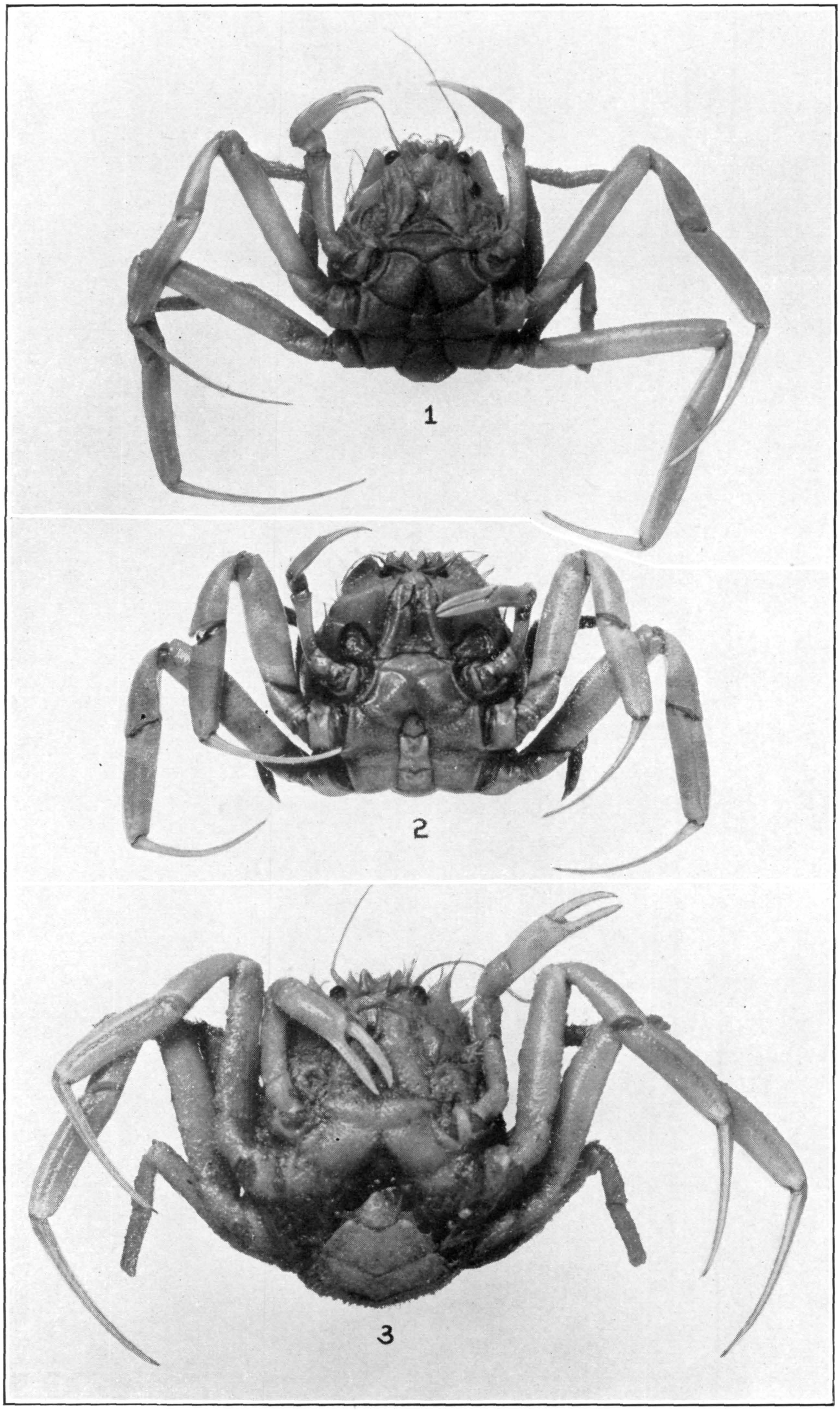
SPECIES OF ETHUSA.

1, *E. mascarone panamensis*, ovigerous female (66797), × 2½, ventral view; 2, *E. m. americana*, male, Tiburon Island, × 3, ventral view; 3, *E. microphthalma*, male (66829), natural size, ventral view.



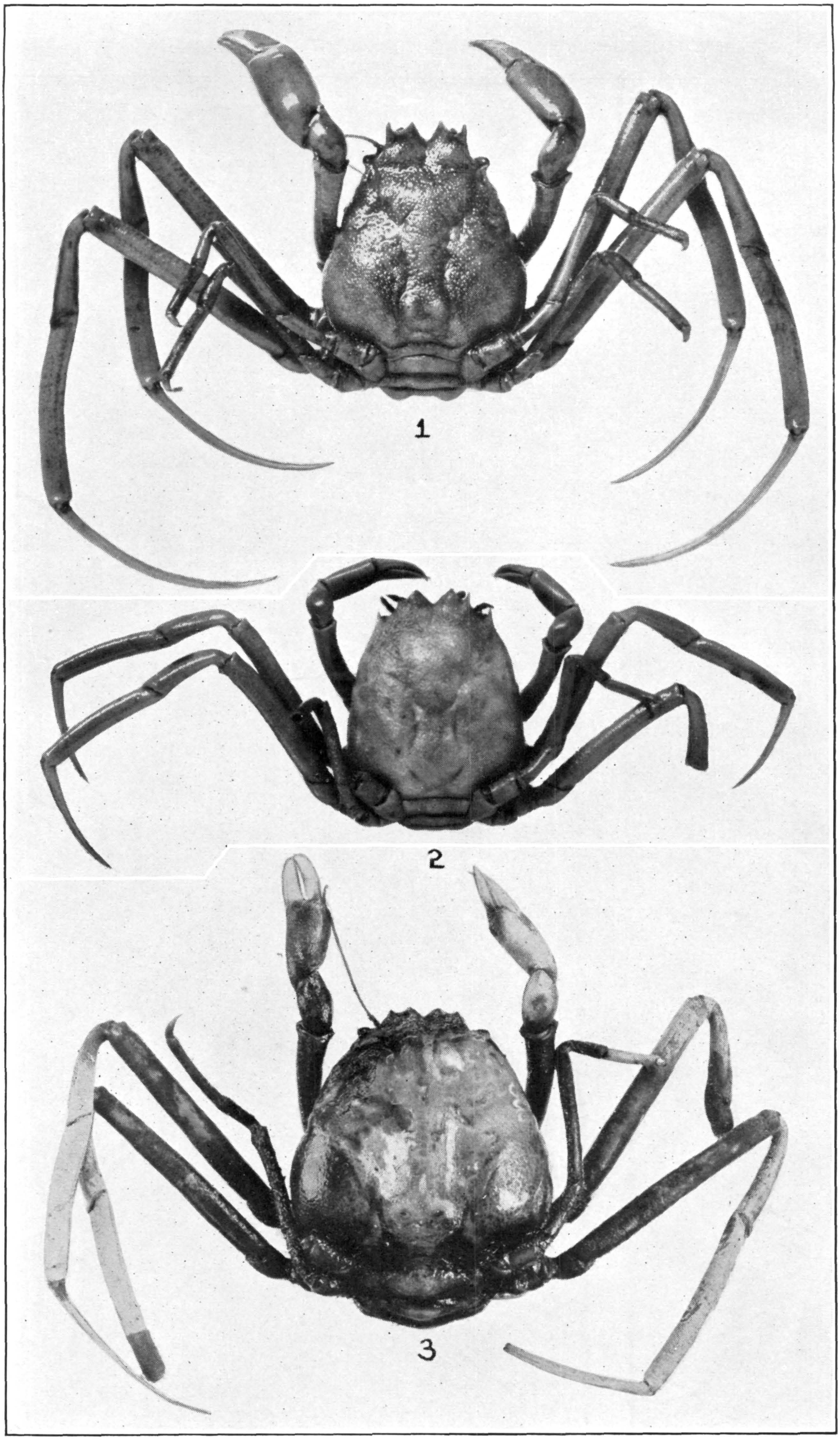
SPECIES OF ETHUSA.

1, *E. lata*, male (22147), × 3, dorsal view; 2, *E. ciliatifrons*, male holotype (20630), natural size, dorsal view; 3, *E. tenuipes*, female (66815), × 3, dorsal view.



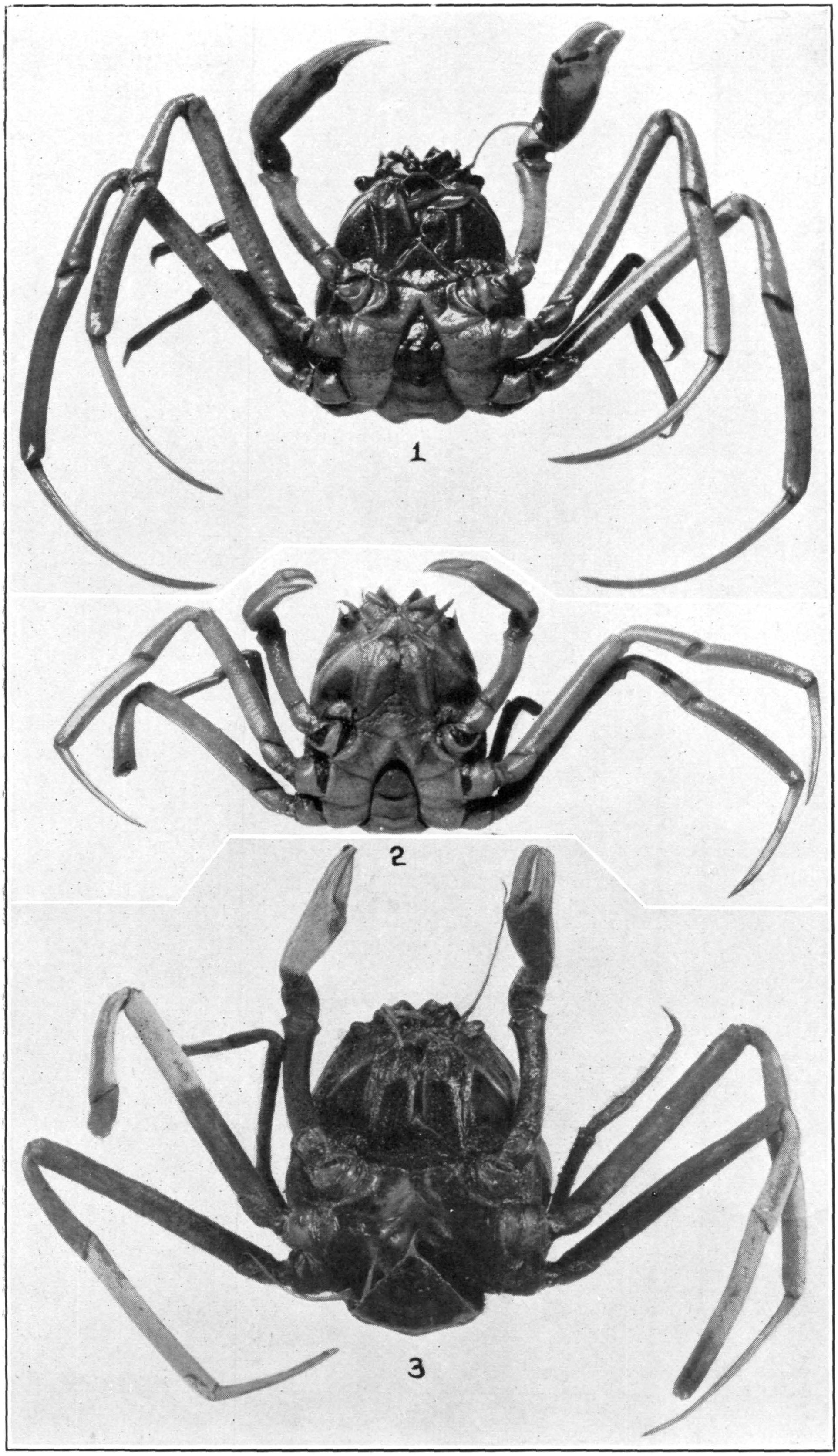
SPECIES OF ETHUSA.

1, *E. lata*, male (22147), × 3, ventral view; 2, *E. ciliatifrons*, male holotype (20630), natural size, ventral view; 3, *E. tenuipes*, female (66815), × 3, ventral view.



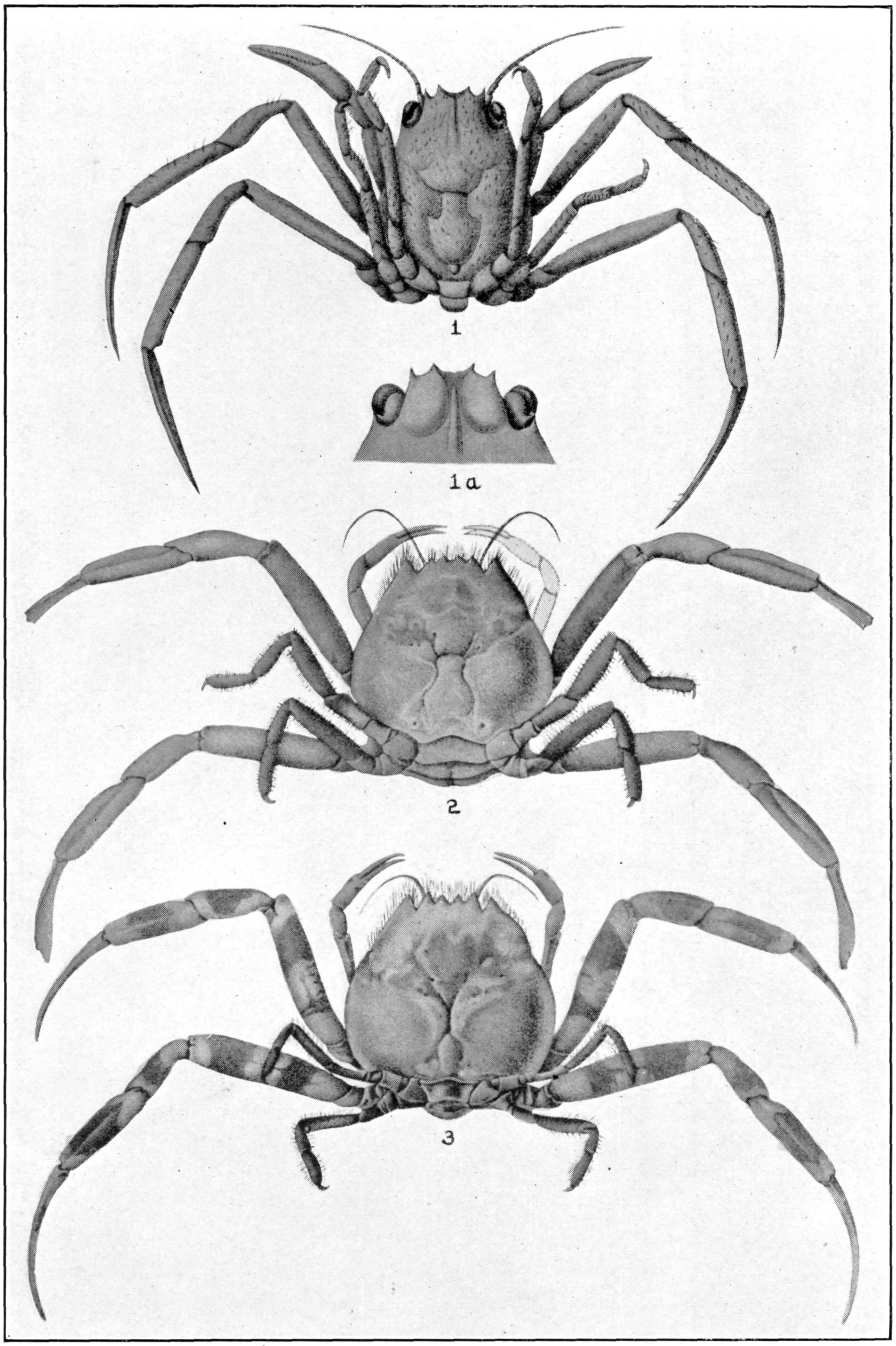
SPECIES OF ETHUSINA.

1, *E. abyssicola*, male holotype (7119), × 2, dorsal view; 2, *E. smithiana*, male holotype (20631), × 3, dorsal view; 3, *E. faxonii*, female holotype (M. C. Z. no. 4502), × 2, dorsal view.



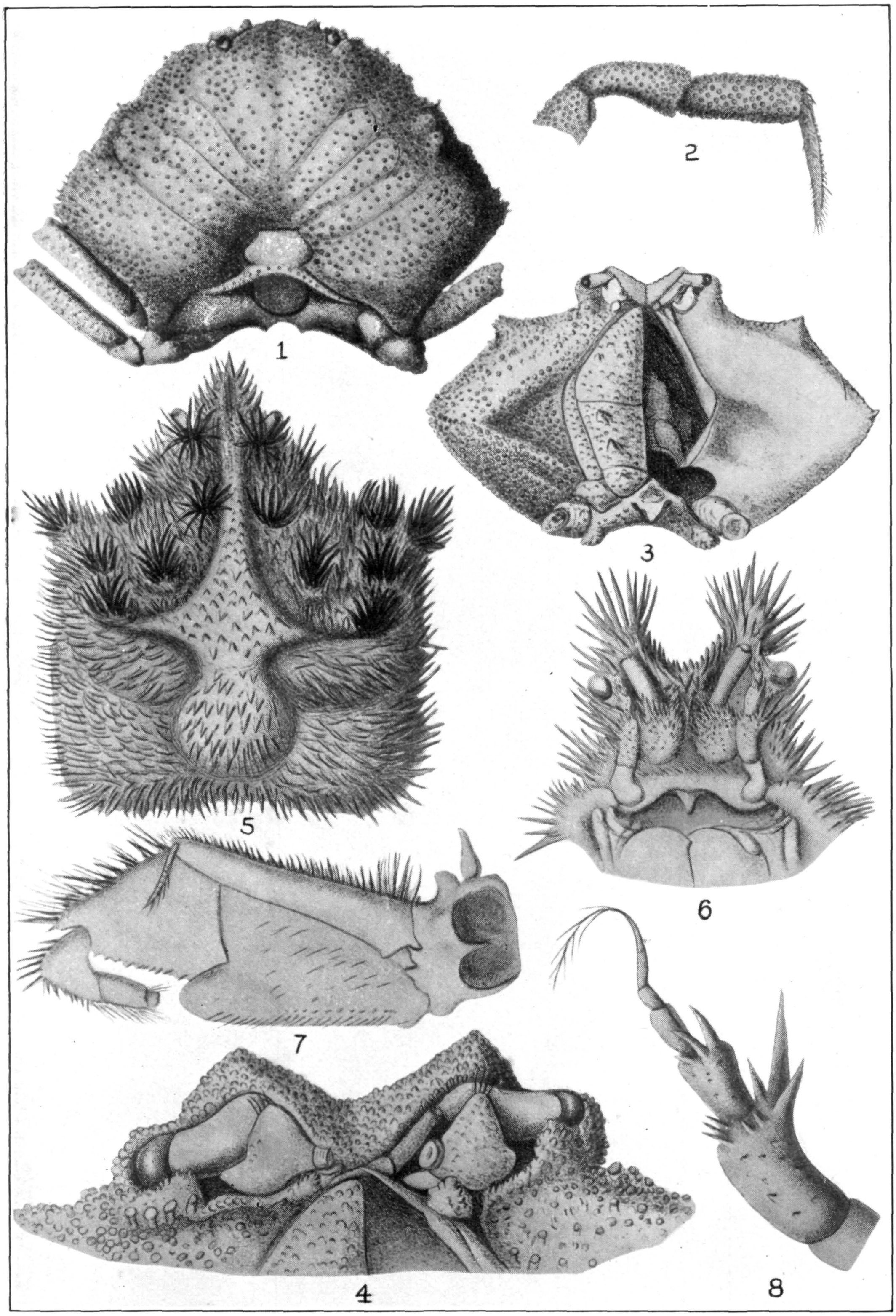
SPECIES OF ETHUSINA.

1, *E. abyssicola*, male holotype (7119), × 2, ventral view; 2, *E. smithiana*, male holotype (20631), × 3, ventral view; 3, *E. faxonii*, female holotype (M. C. Z. no. 4502), × 2, ventral view.



SPECIES OF ETHUSA.

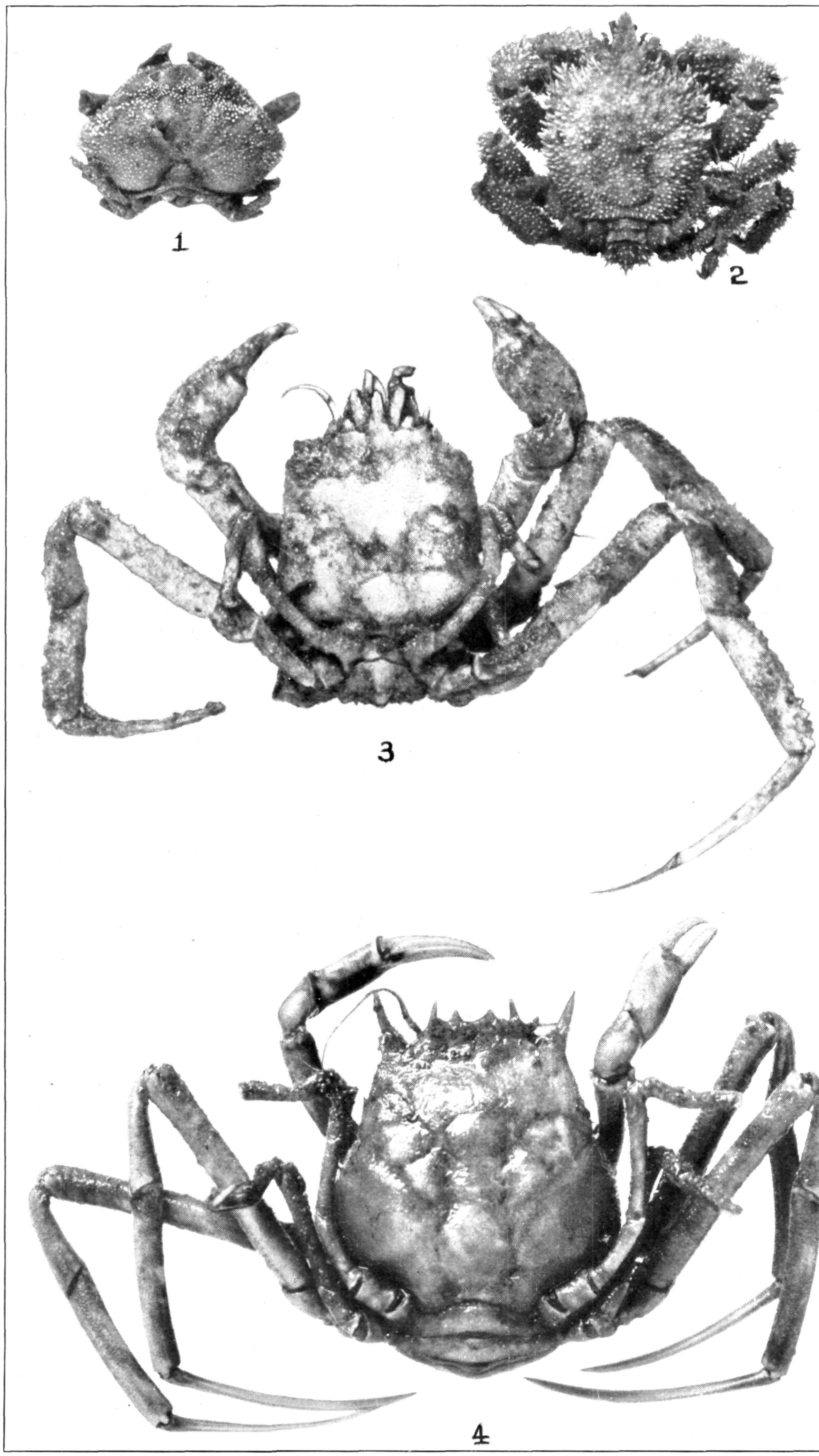
1, *E. truncata*, male, × 5½ (approximately), dorsal view (after A. Milne Edwards and Bouvier); 1a, front of same species, × 15¾, dorsal view (after A. Milne Edwards and Bouvier); 2, *E. lata*, female, about natural size, dorsal view (after Faxon); 3, *E. ciliatifrons*, male, about natural size, dorsal view (after Faxon).



CORYCODUS BULLATUS AND CYMOPOLUS ASPER.

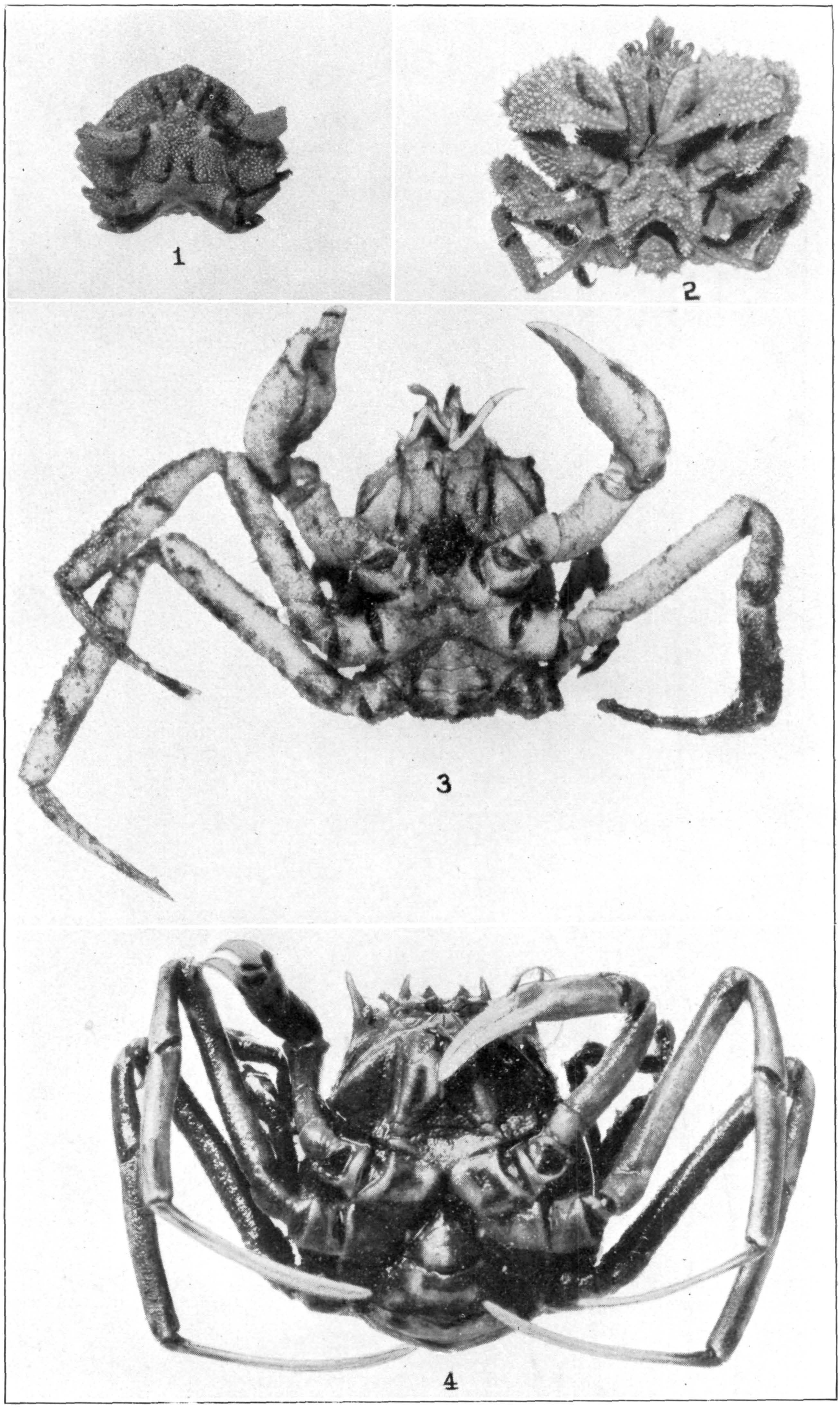
1–4, *Corycodus bullatus:* 1, Carapace, female, × 7½, dorsal view; 2, ambulatory leg, × 21; 3, ventral surface of same, with outer maxilliped, × 7½; 4, anterior end of same, with appendages, × 21, ventral view. (After A. Milne Edwards and Bouvier.)

5–8, *Cymopolus asper:* 5, Carapace, male, × 7½, dorsal view; 6, anterior part of same, with antennae, × 11, ventral view; 7, left outer maxilliped, × 13, dorsal view; 8, left antenna, × 30, ventral view.



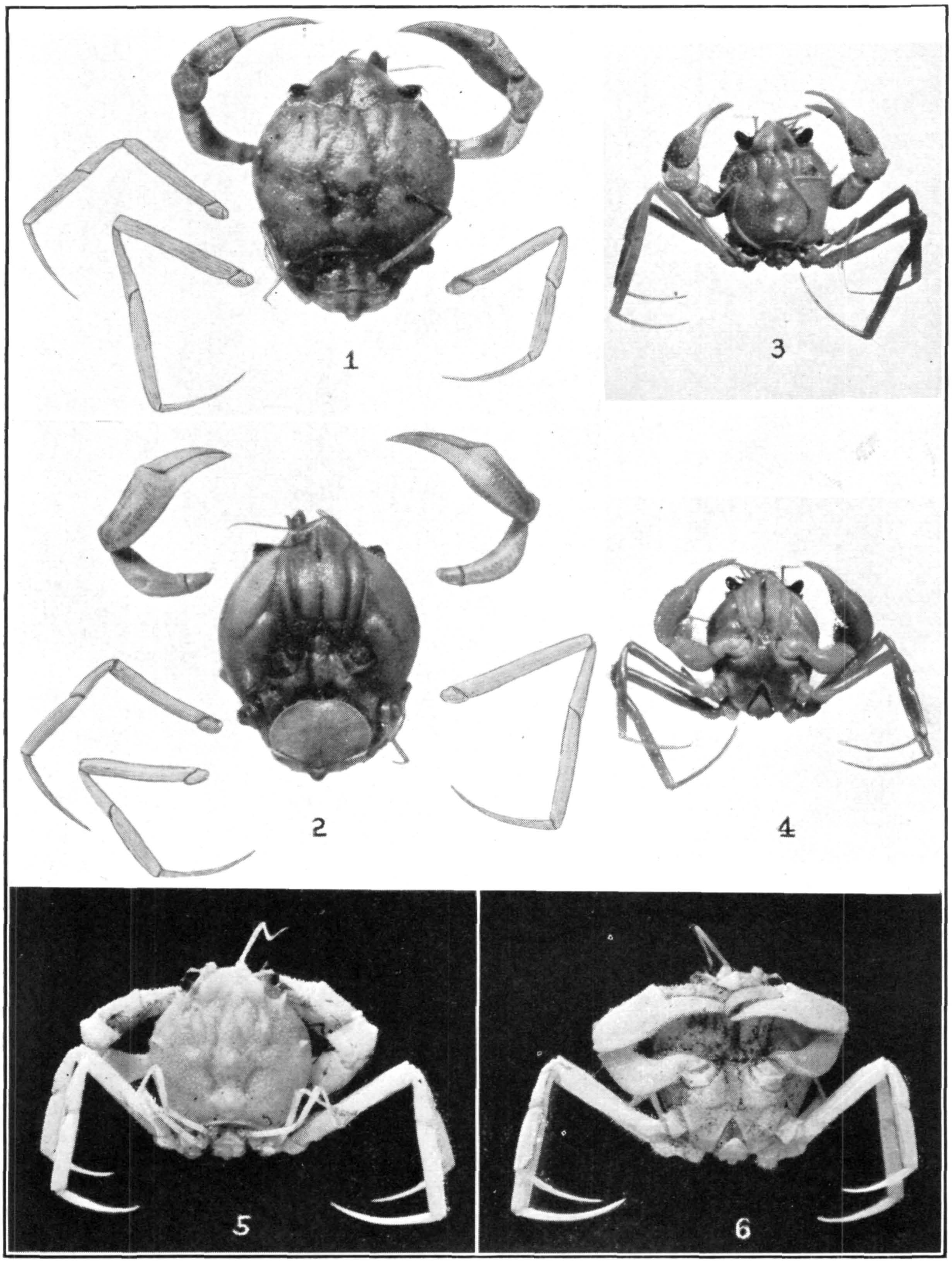
SPECIES OF CORYCODUS, CYMOPOLUS, CYMONOMUS, AND ETHUSINA.

1, *Corycodus bullatus*, female (18061), × 3, dorsal view; 2, *Cymopolus agassizii*, male (18682), × 3, dorsal view; 3, *Cymonomus quadratus*, male (68094), × 3, dorsal view; 4, *Ethusina gracilipes*, female (20633), × 2, dorsal



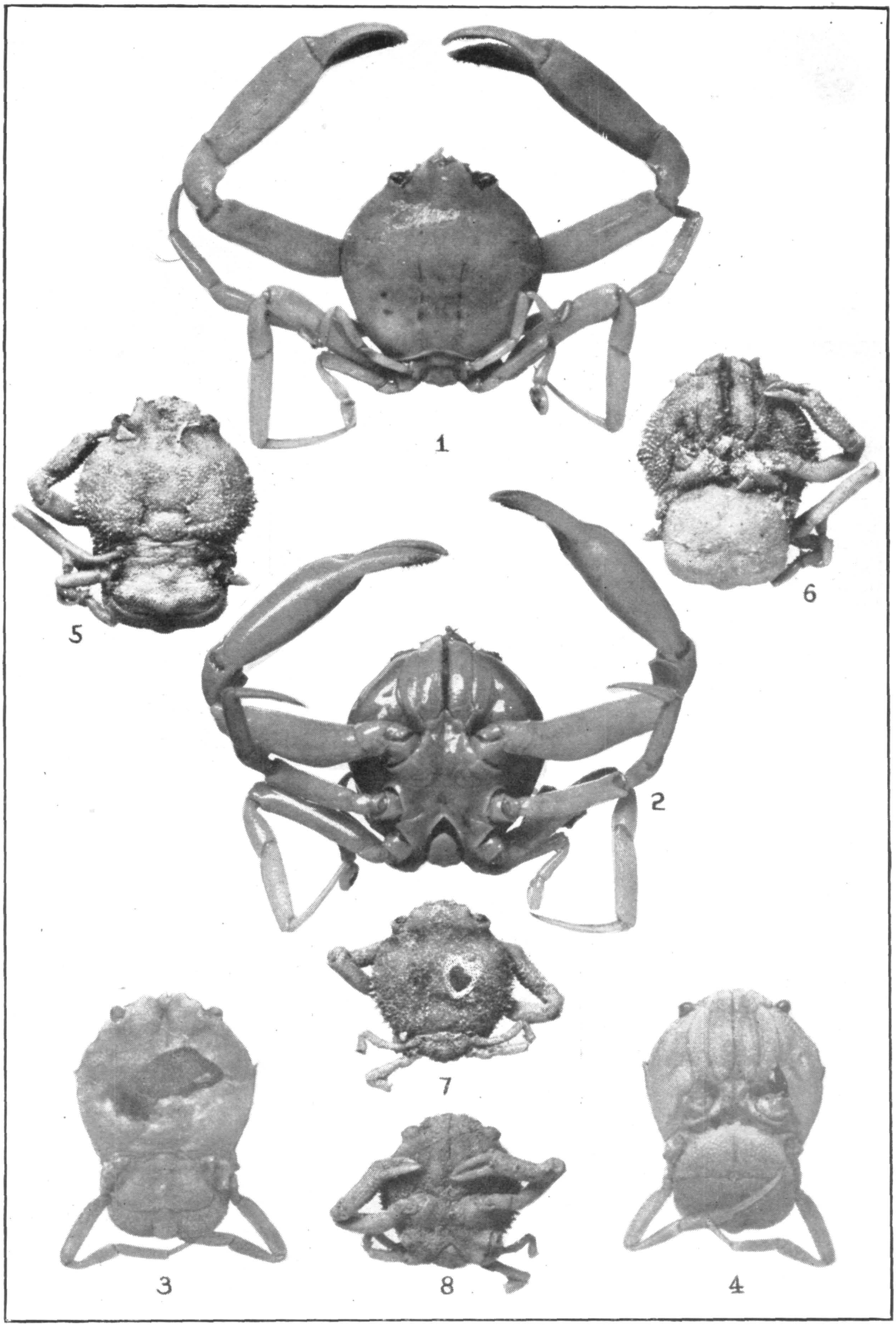
SPECIES OF CORYCODUS, CYMOPOLUS, CYMONOMUS, AND ETHUSINA.

1, *Corycodus bullatus*, female (18061), × 3, ventral view; 2, *Cymopolus agassizii*, male (18682), × 3, ventral view; 3, *Cymonomus quadratus*, male (68094), × 3, ventral view; 4, *Ethusina gracilipes*, female (20633), × 2, ventral view.



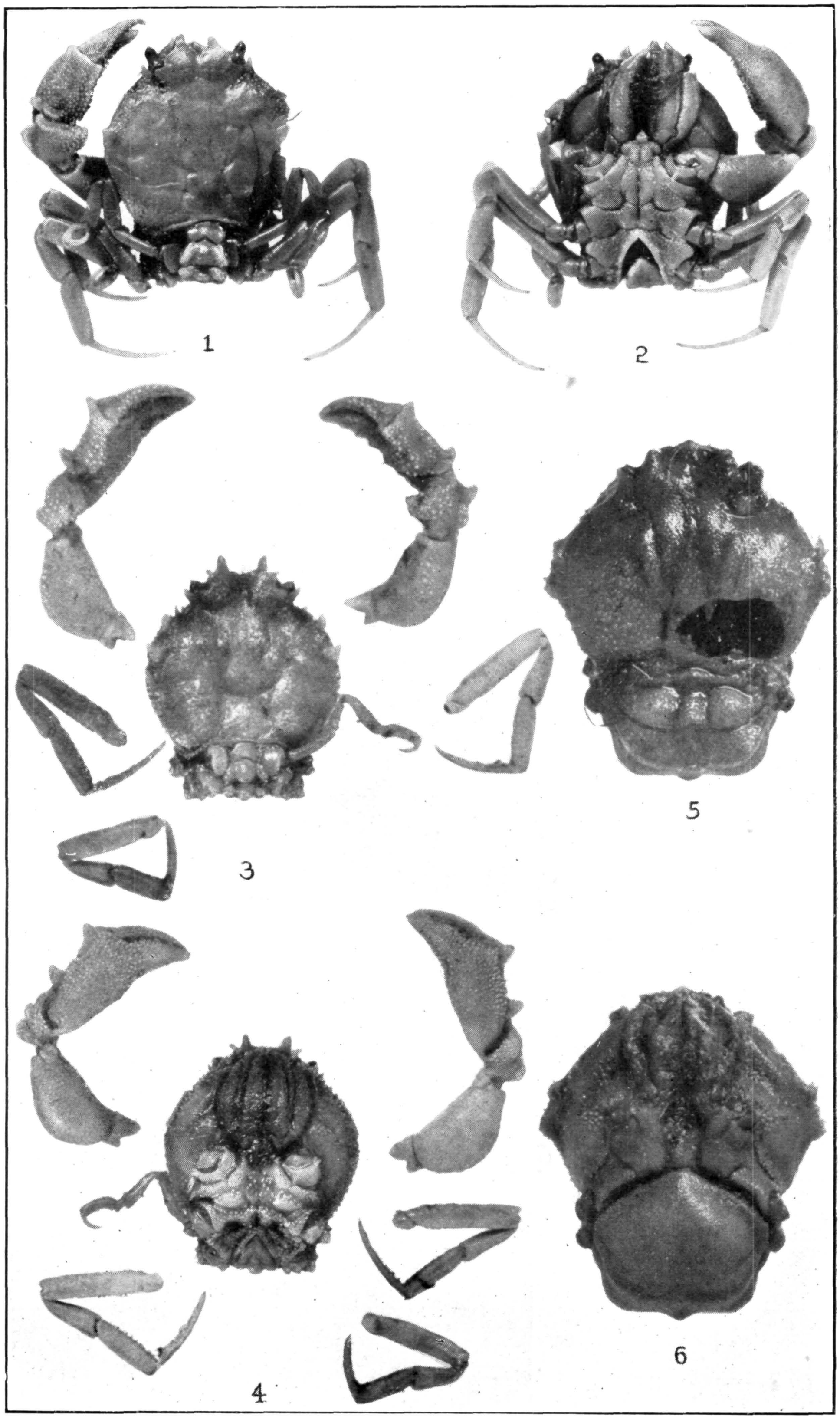
SPECIES OF CYCLODORIPPE.

1, *C. antennaria*, female (9517), × 3⅓, dorsal view; 2, same, ventral view; 3, *C. bouvieri*, male holotype (67990), × 2½, dorsal view; 4, same, ventral view; 5, *C. agassizii*, male (68071), × 2½, dorsal view; 6, same, ventral view.



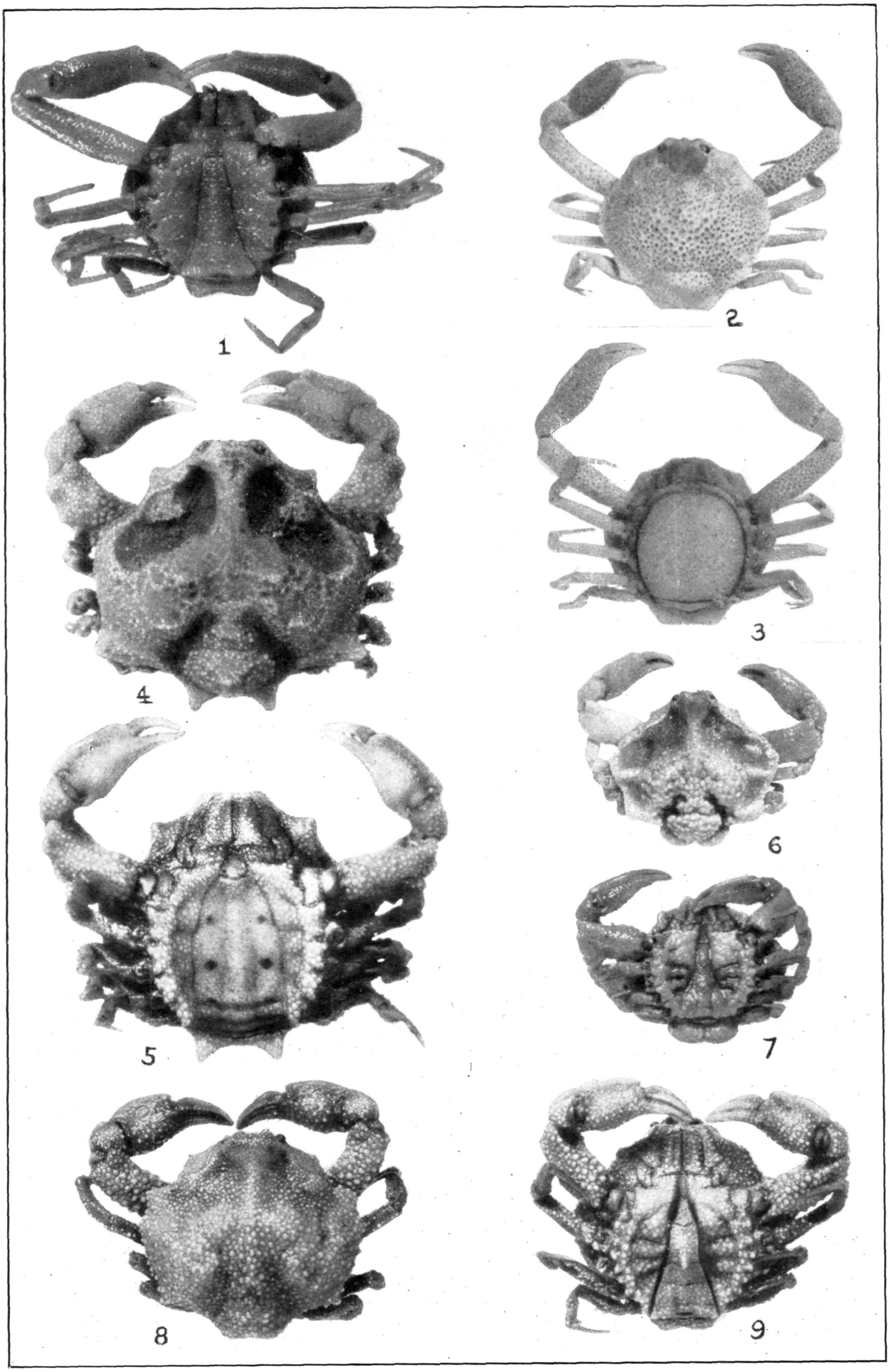
SPECIES OF CLYTHROCERUS.

1, *C. nitidus*, male (18681), × 2⅖, dorsal view; 2, same, ventral view; 3, *C. perpusillus*, female holotype (23777), × 8 (approximately), dorsal view; 4, same, ventral view; 5, *C. granulatus*, female (67454), × 4, dorsal view; 6, same, ventral view; 7, *C. granulatus*, male (67453), × 5⅗, dorsal view; 8, same, ventral view.



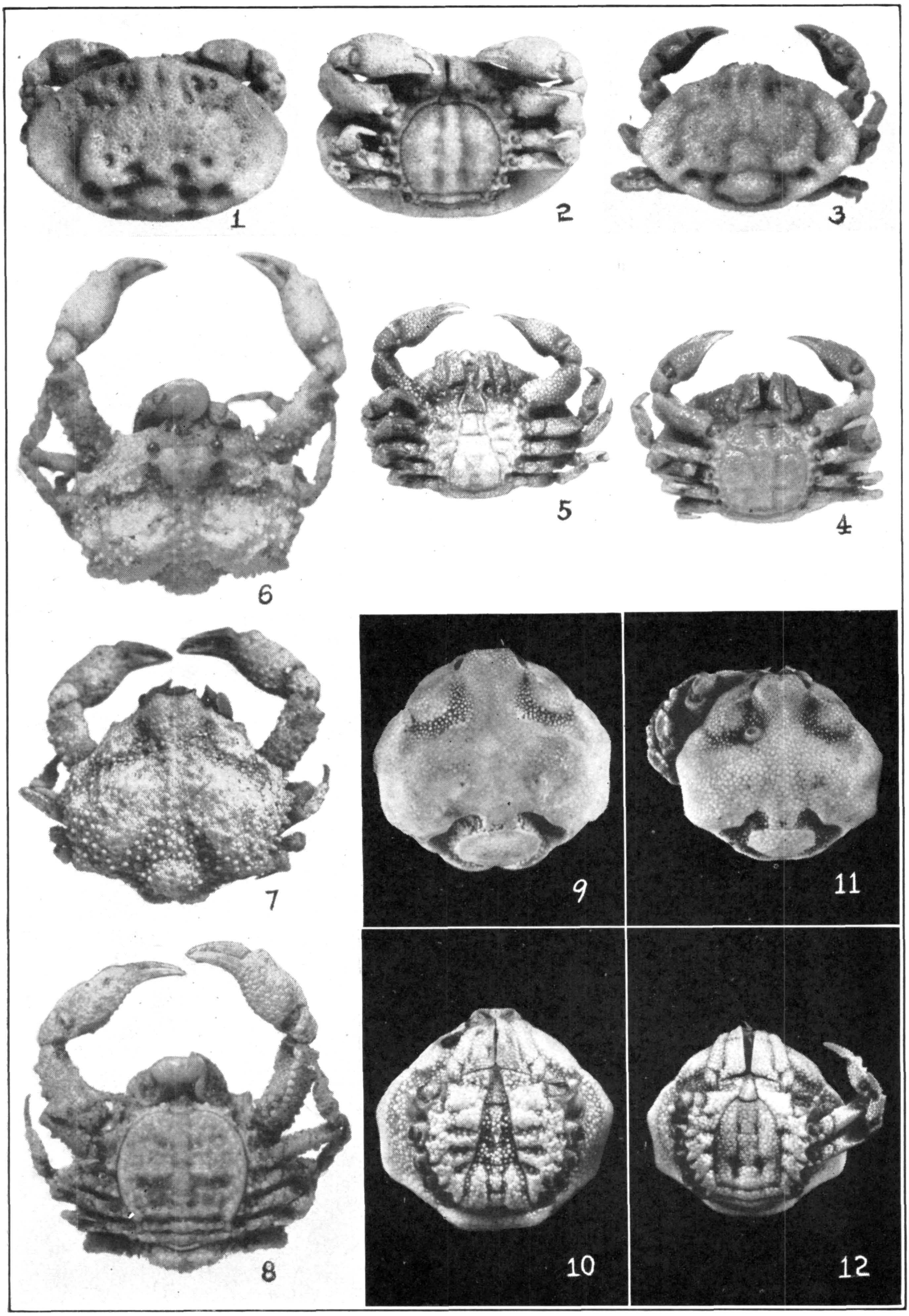
SPECIES OF CLYTHROCERUS.

1, *C. planus*, male (50611), × 2 7/10, dorsal view; 2, same, ventral view; 3, *C. decorus*, male holotype (67435), × 3 3/5, dorsal view; 4, same, ventral view; 5, *C. stimpsoni*, female type (M. C. Z. no. 8261), × 9, dorsal view; 6, same, ventral view.



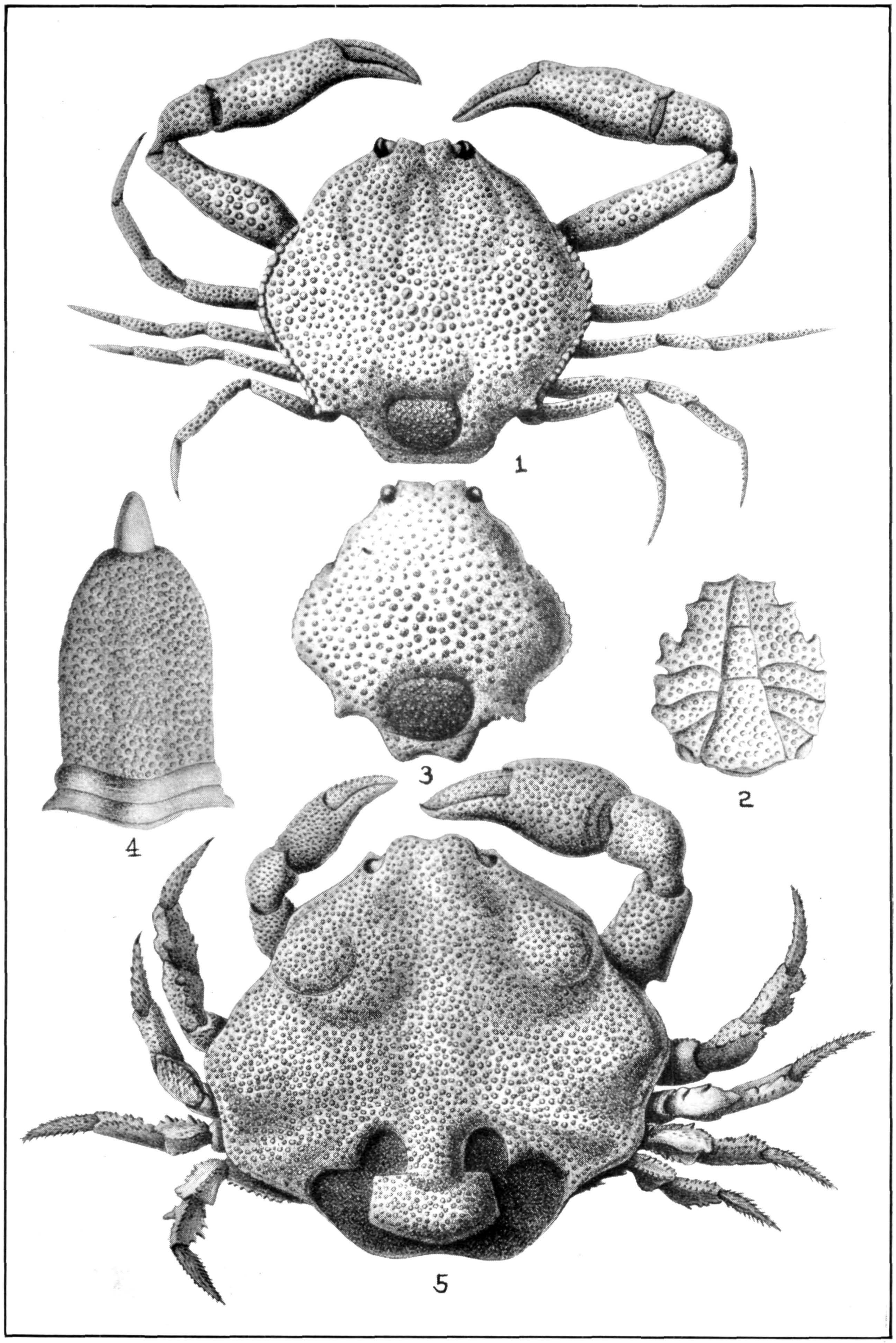
SPECIES OF EBALIA.

1, *E. stimpsonii*, male (66514), × 4 (approximately), ventral view; 2, *E. stimpsonii*, female (66514), × 4, dorsal view; 3, same, ventral view; 4, *E. magdalenensis*, young female, Concepcion Bay (Glassell collection), × 3, dorsal view; 5, same, ventral view; 6, *E. cariosa*, male (17858), × 2, dorsal view; 7, same, ventral view; 8, *E. cristata*, male type (21599), × 3, dorsal view; 9, same, ventral view.



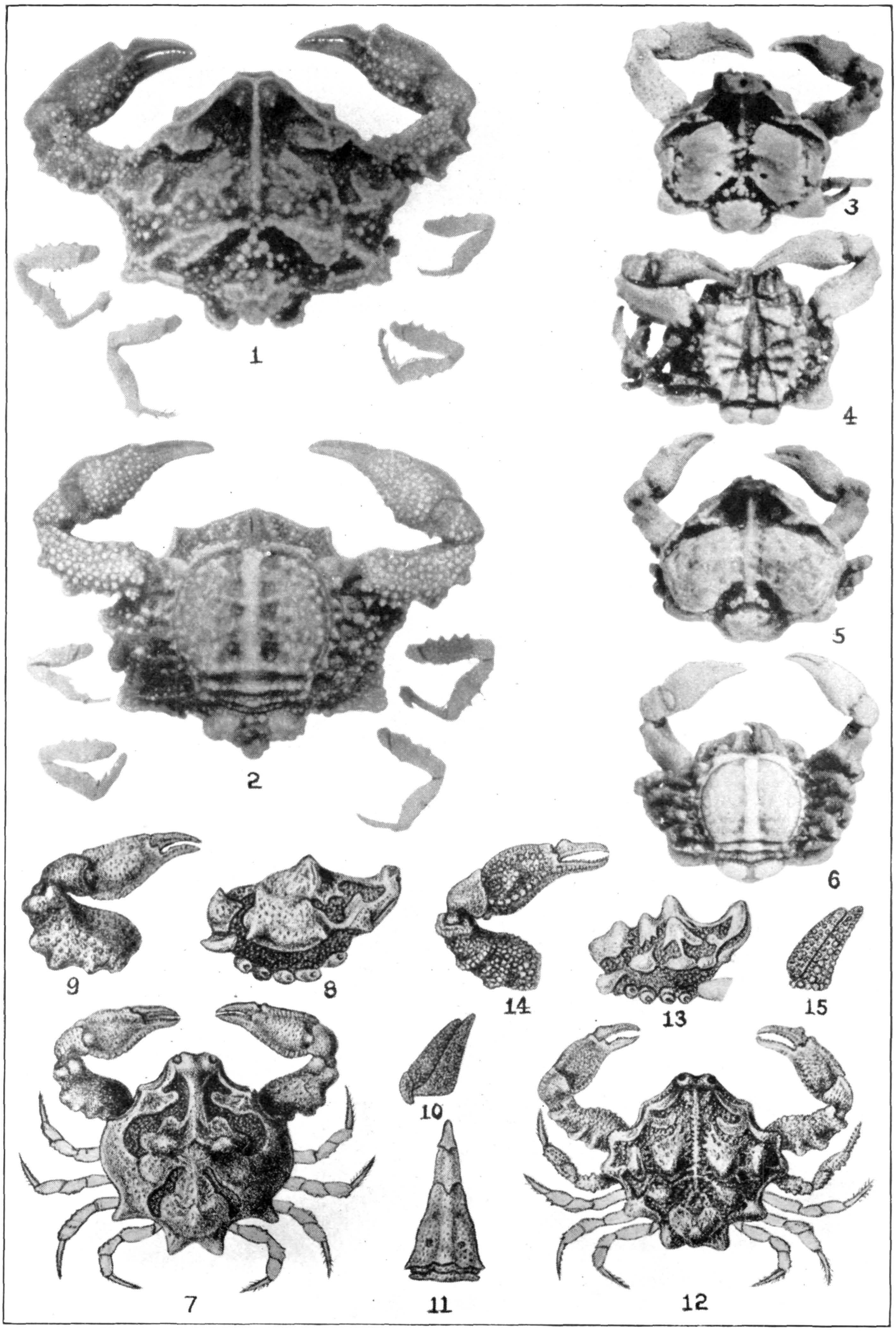
SPECIES OF UHLIAS AND EBALIA.

1, *Uhlias ellipticus*, female (68259), × 3⅗, dorsal view; 2, same, ventral view; 3, *U. limbatus*, female (55204), × 2⁷⁄₁₀ (approximately), dorsal view; 4, same, ventral view; 5, *U. limbatus*, male (55203), × 2⁷⁄₁₀ (approximately), ventral view; 6, *Ebalia hancocki*, female holotype (67988), × 3⅗ (approximately), dorsofrontal view; 7, same, dorsal view; 8, same, ventral view; 9, *E. rotundata*, male (M. C. Z. no. 6662), × 2⁷⁄₁₀, dorsal view; 10, same, ventral view; 11, *E. rotundata*, female (M. C. Z. no. 6662), × 2⁷⁄₁₀, dorsal view; 12, same, ventral view.



SPECIES OF EBALIA.

1, *E. stimpsonii*, female, dorsal view; 2, *E. stimpsonii*, male, sternum and abdomen, ventral view; 3, *E. stimpsonii*, carapace of small male, dorsal view; 4, *E. rotundata*, abdomen of female, ventral view; 5, *E. rotundata*, female, dorsal view. All × 7½. (After A. Milne Edwards and Bouvier.)

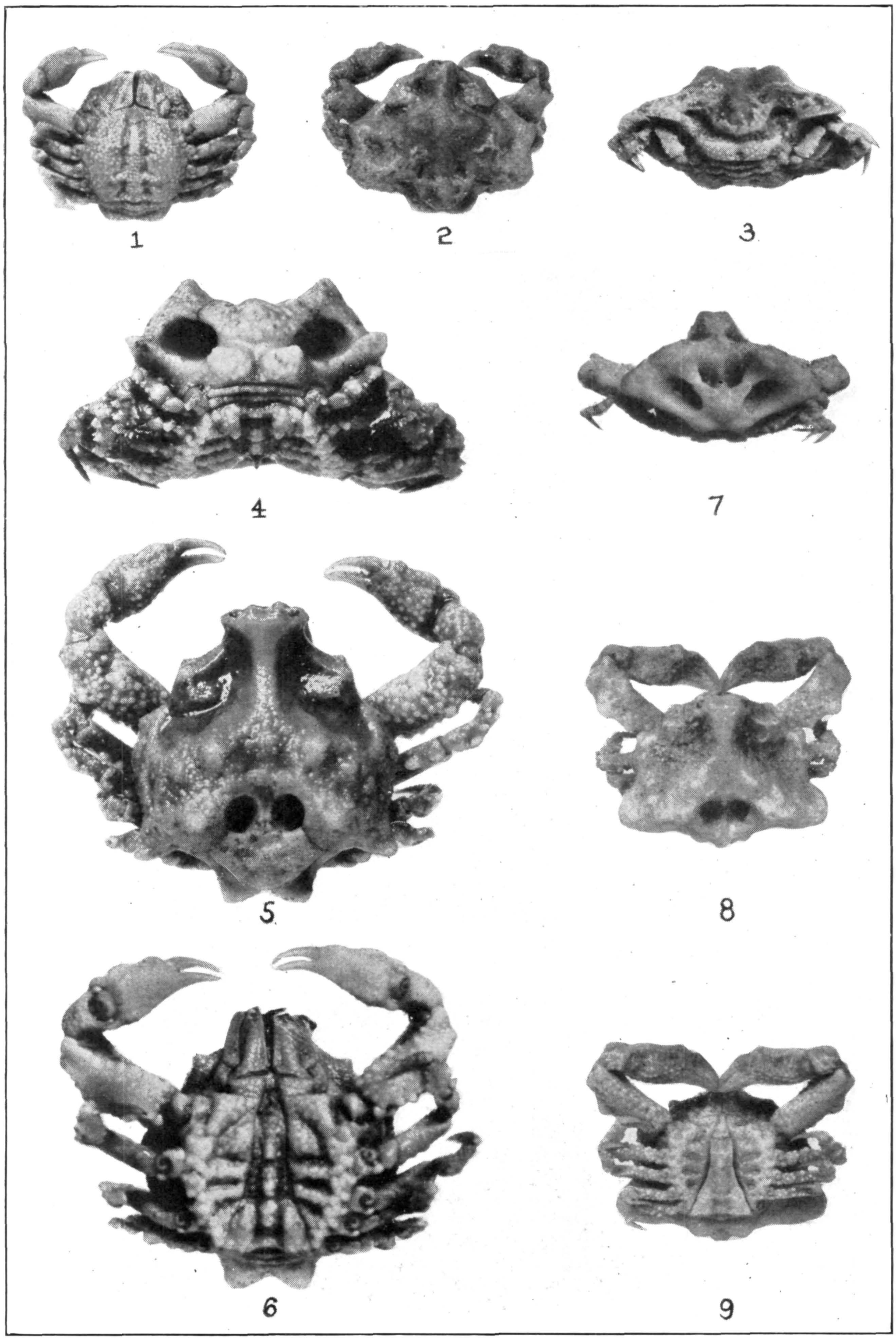


SPECIES OF LITHADIA.

1, 2, *L. cumingii:* 1, Female (22132), × 3, dorsal view; 2, same, ventral view.

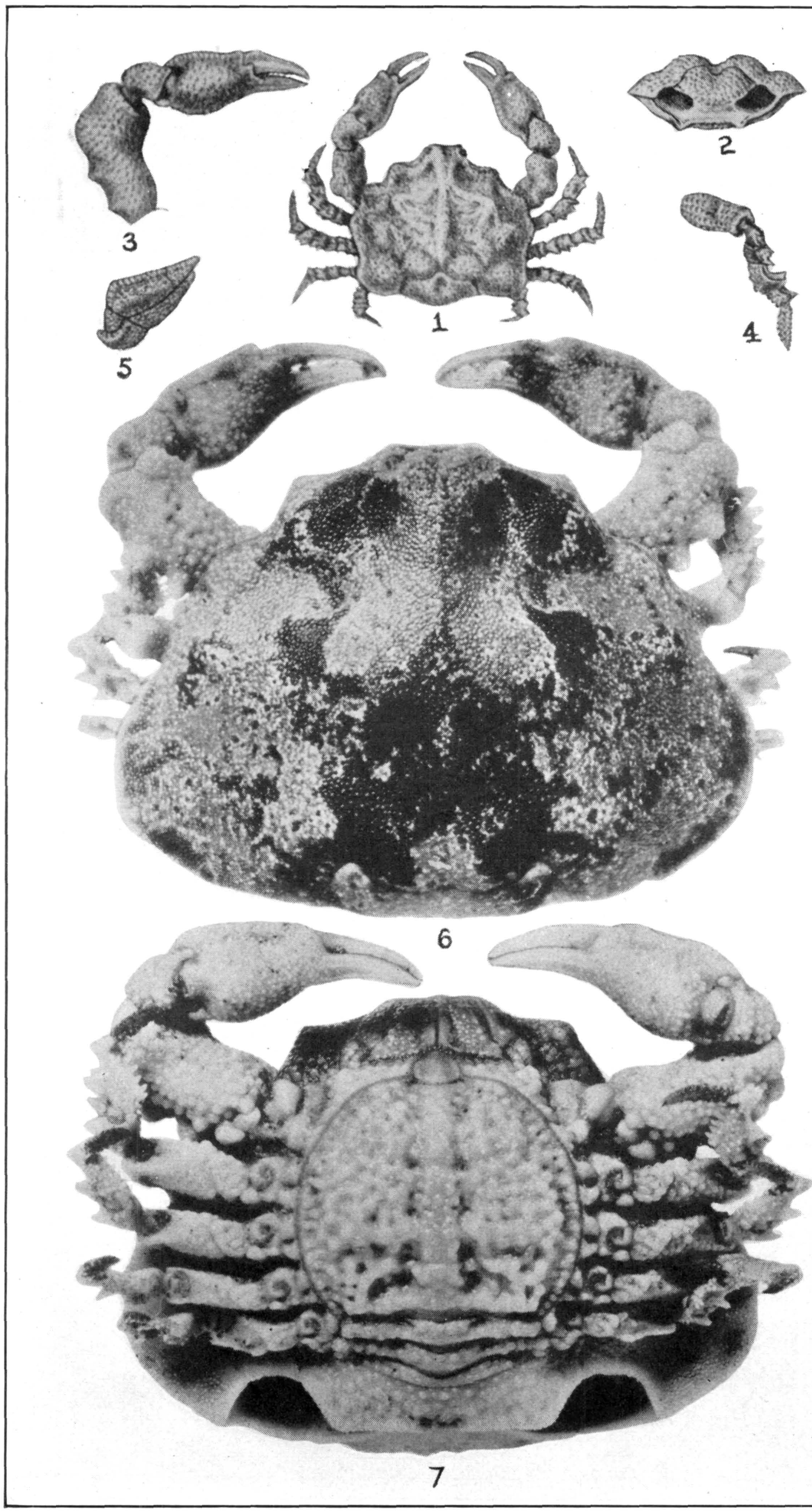
3–6, *L. cadaverosa:* 3, Male (17855), × 3, dorsal view; 4, same, ventral view; 5, female (17854), × 3, dorsal view; 6, same, ventral view.

7–15, *L. cumingii:* 7, Male, dorsal view; 8, right side of carapace; 9, left cheliped; 10, right outer maxilliped; 11, abdomen; 12, young male, dorsal view; 13, right side of carapace; 14, left cheliped; 15, right outer maxilliped. (After Bell.)



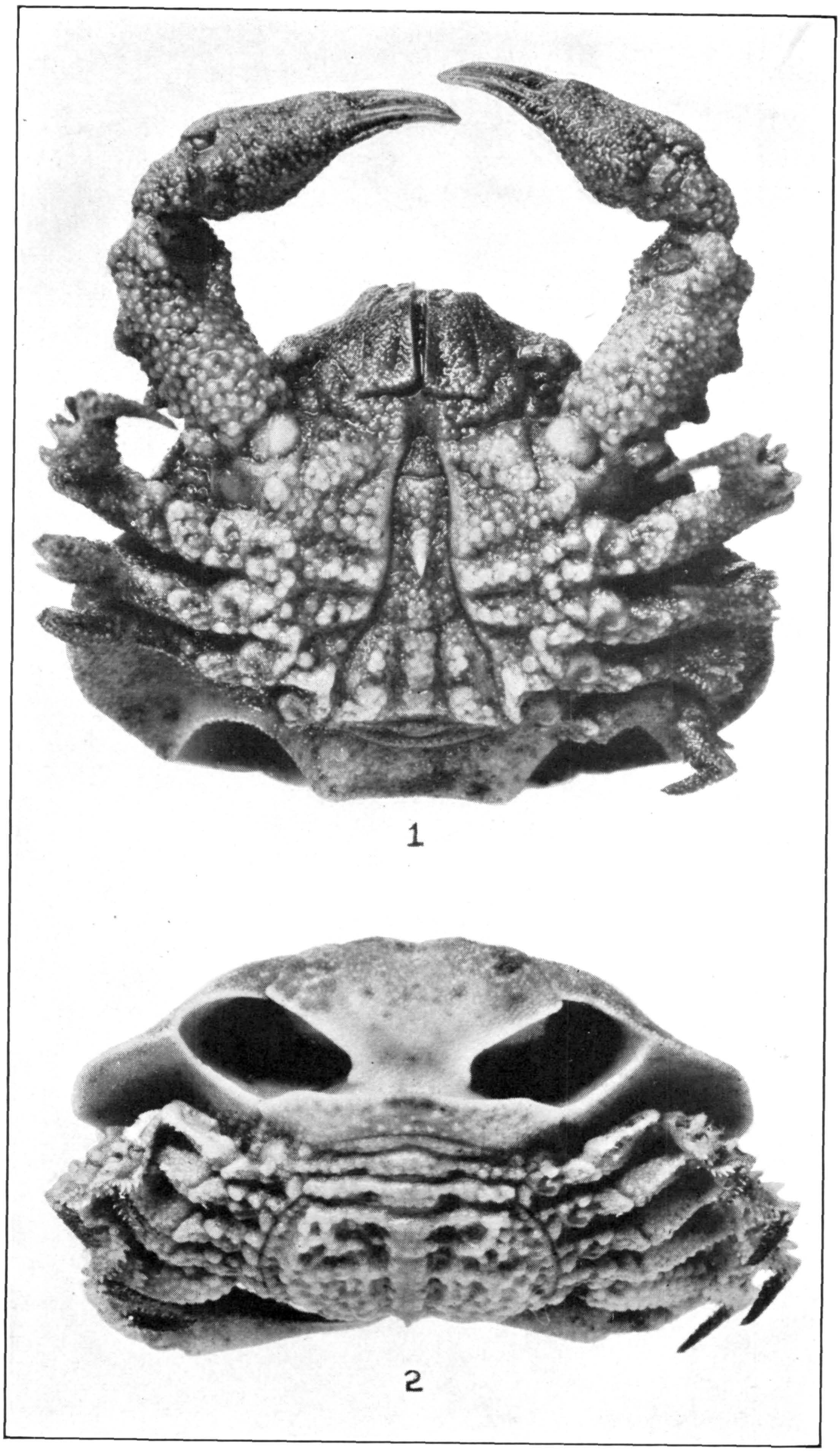
SPECIES OF SPELOEOPHORUS.

1, *S. pontifer*, female (17853), × 2, ventral view; 2, same, dorsal view; 3, same, posterior view; 4, *S. digueti*, male (66515), × 2, posterior view; 5, same, dorsal view; 6, same, ventral view; 7, *S. elevatus*, male (66524), × 2 (approximately), posterior view; 8, same, dorsal view; 9, same, ventral view.



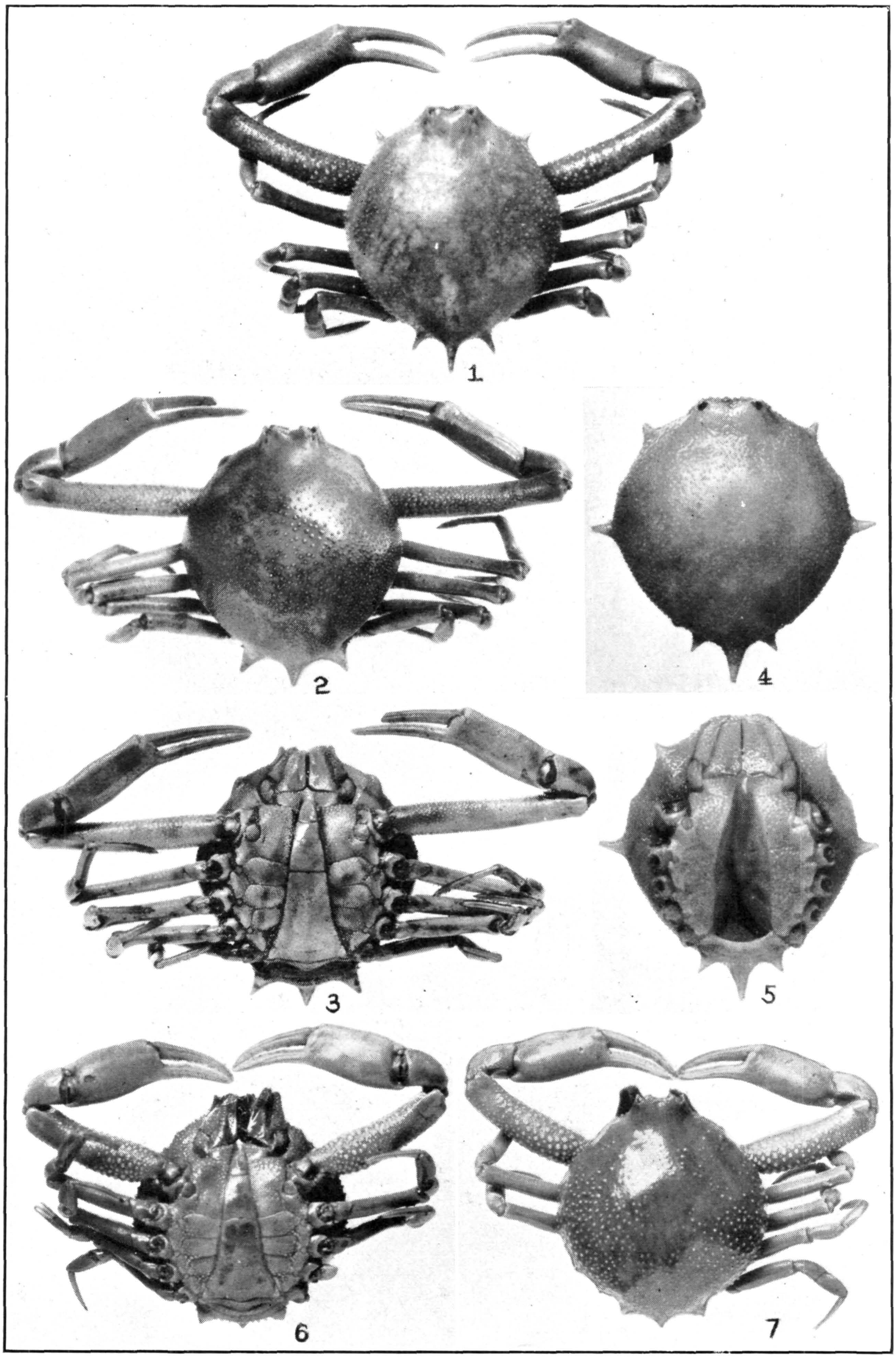
SPECIES OF SPELOEOPHORUS.

1, *S. nodosus*, male, dorsal view (after Bell); 2, posterior view of carapace (after Bell); 3, left cheliped (after Bell); 4, posterior leg (after Bell); 5, left outer maxilliped (after Bell); 6, *S. schmitti*, female holotype (67728), × 2, dorsal view; 7, same, ventral view.



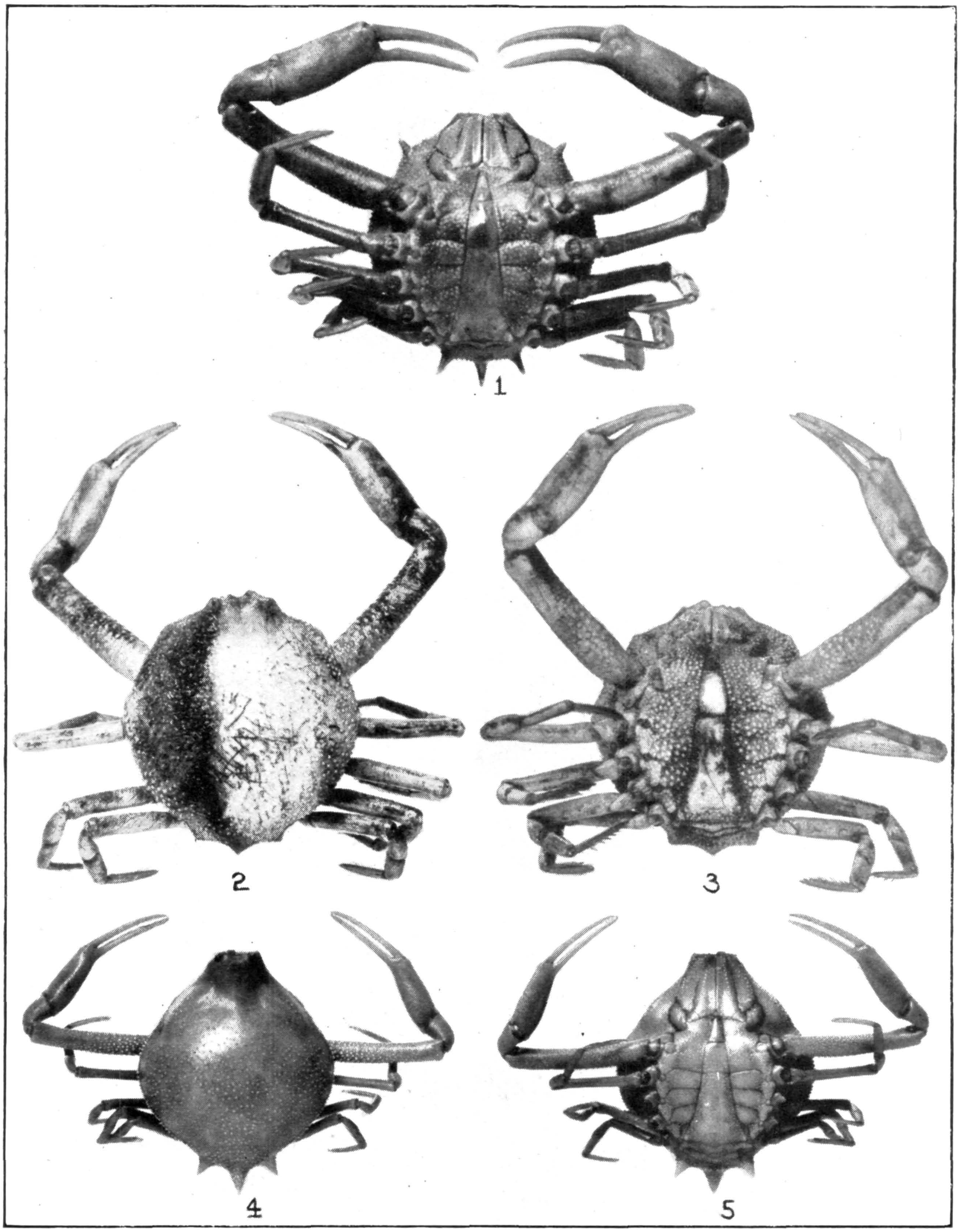
SPELOEOPHORUS SCHMITTI.

1, Male, San Felipe (Glassell collection), × 2, ventral view; 2, female (67728), × 2, posterior view.



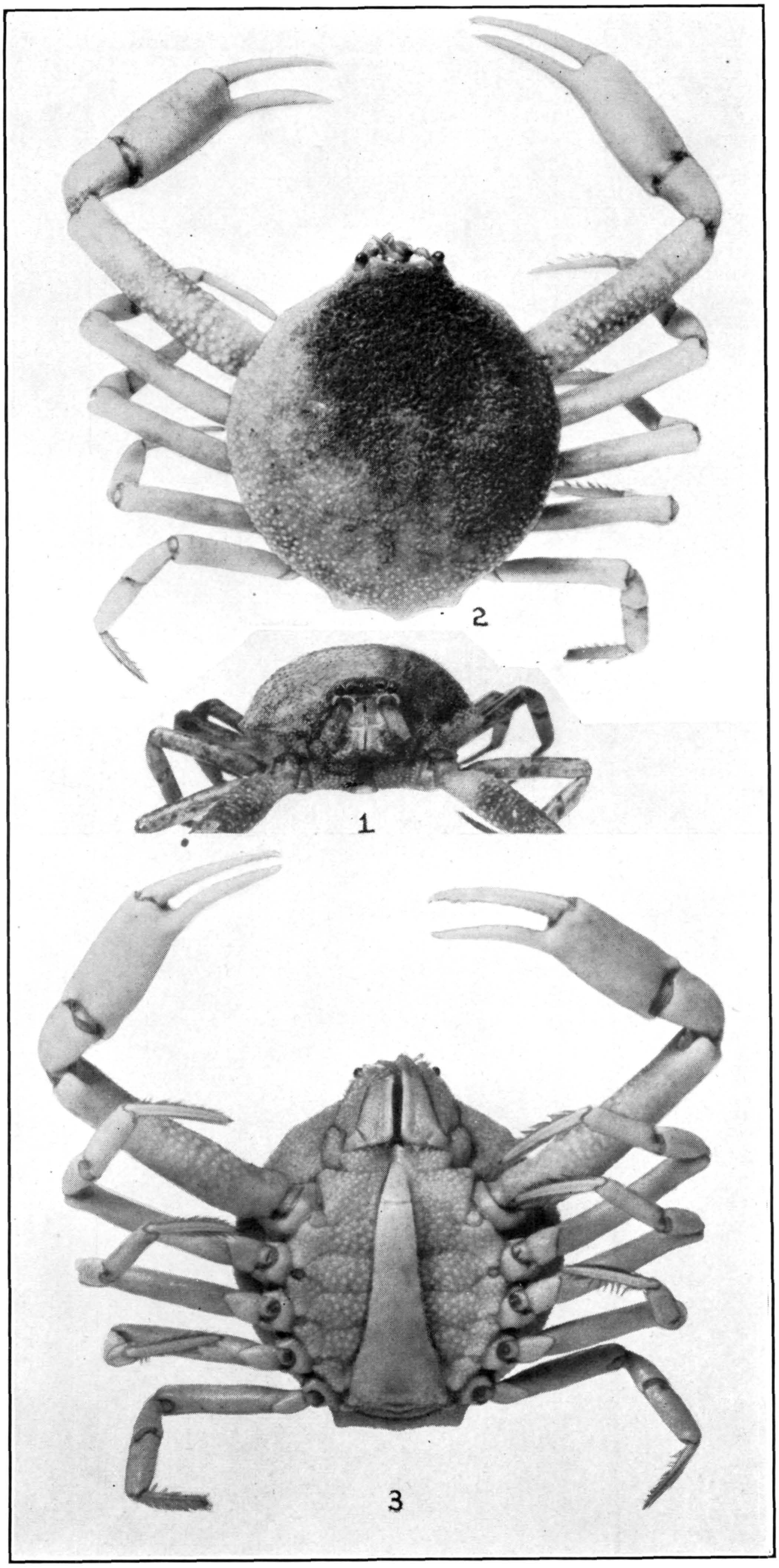
SPECIES OF PERSEPHONA.

1, *P. townsendi*, male (17383), nine-tenths natural size, dorsal view; 2, *P. punctata punctata*, male (7565), nine-tenths natural size, dorsal view; 3, same, ventral view; 4, *P. finneganae*, carapace of young female (66784), × 2⁷⁄₁₀, dorsal view; 5, same, ventral view; 6, *P. punctata aquilonaris*, male (17834), nine-tenths natural size, ventral view; 7, same, dorsal view.



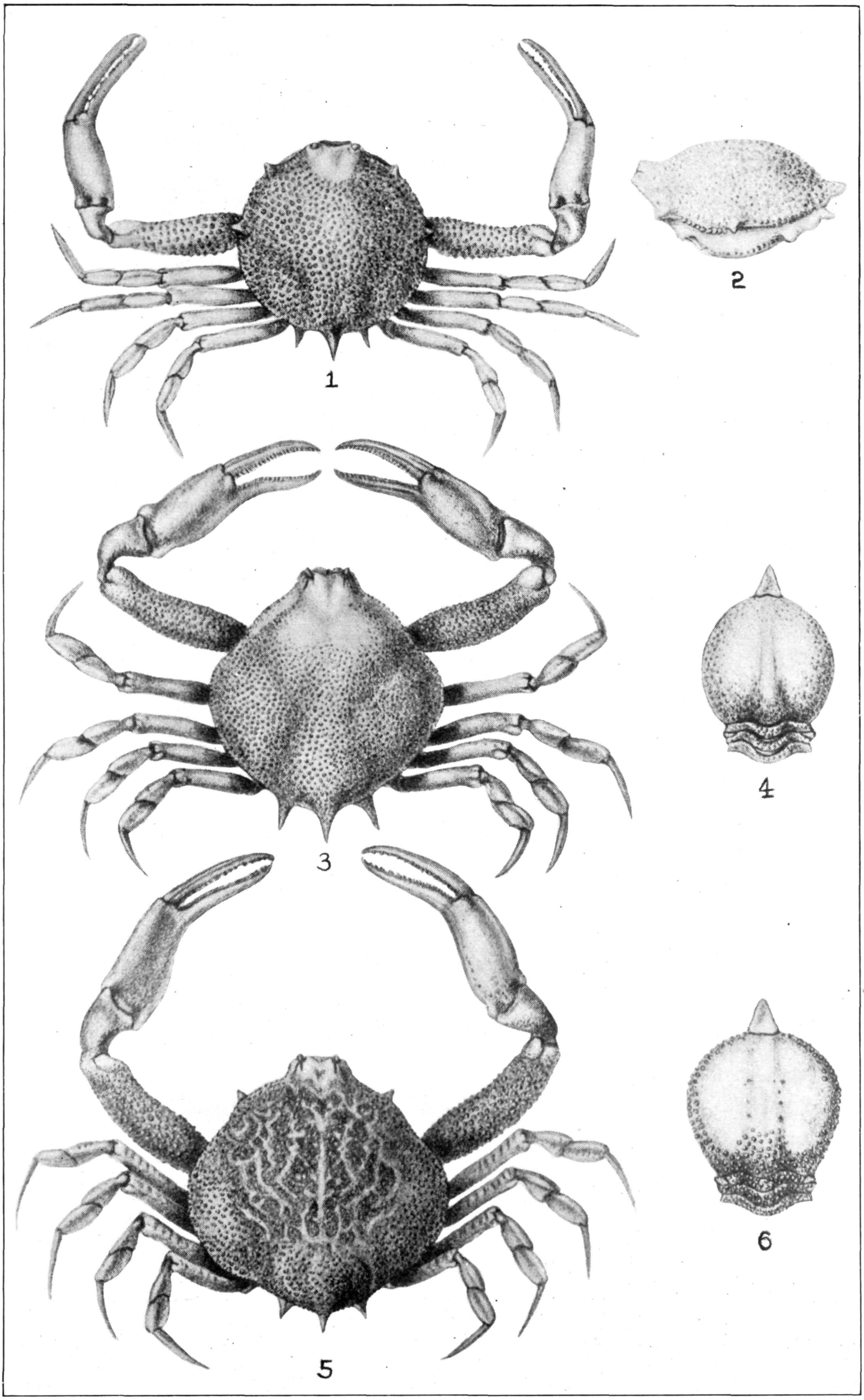
SPECIES OF PERSEPHONA

1, *P. townsendi*, male (17383), nine-tenths natural size, ventral view; 2, *P. crinita*, male holotype (63739), carapace 21.6 mm wide, dorsal view; 3, same, ventral view; 4, *P. subovata*, male holotype (17385), × 1⅘, dorsal view; 5, same, ventral view.



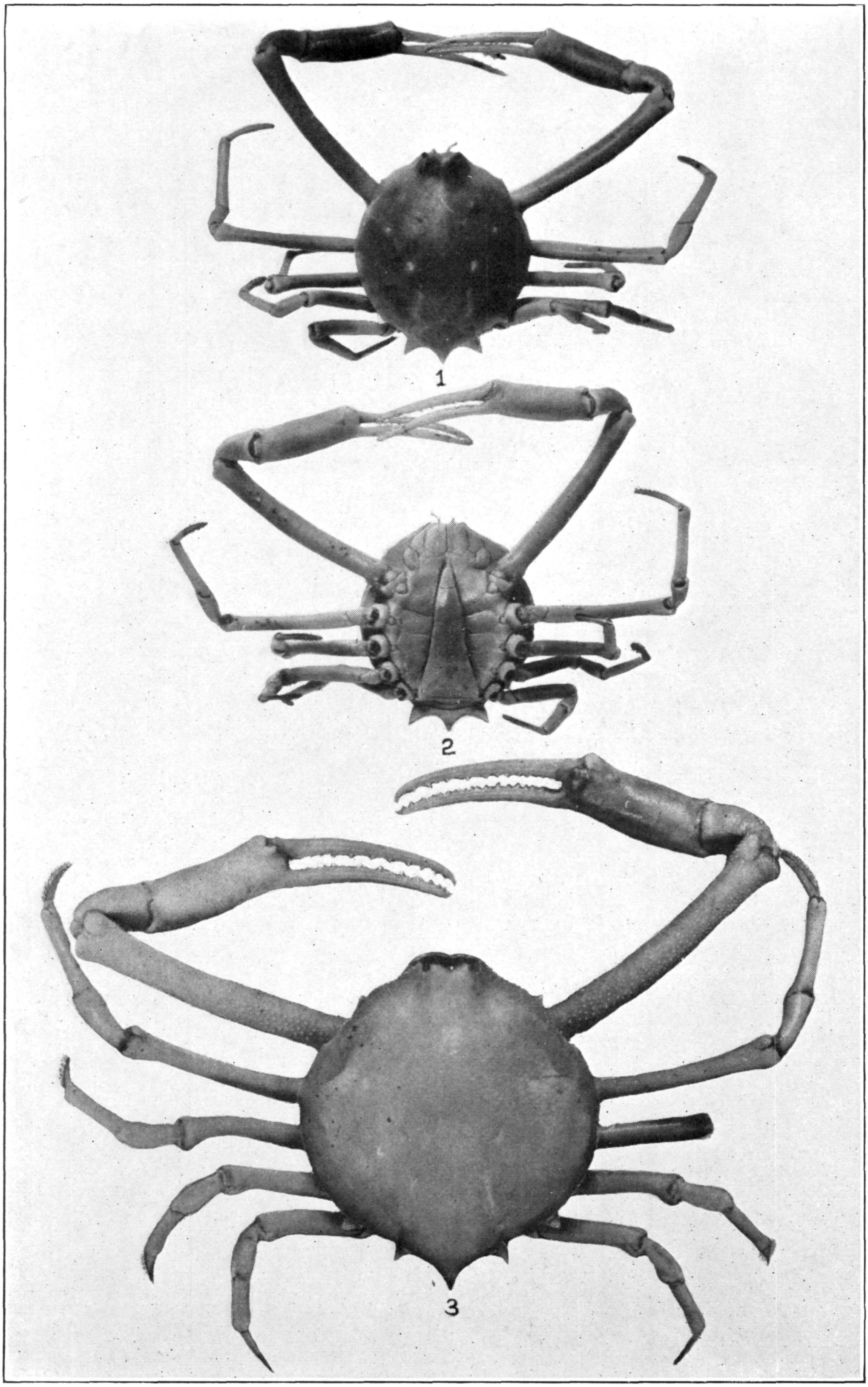
PERSEPHONA CRINITA.

1, Male holotype (63739), carapace 21.6 wide, frontal view; 2, male (66468), × 1⅘, dorsal view; 3, same ventral view.



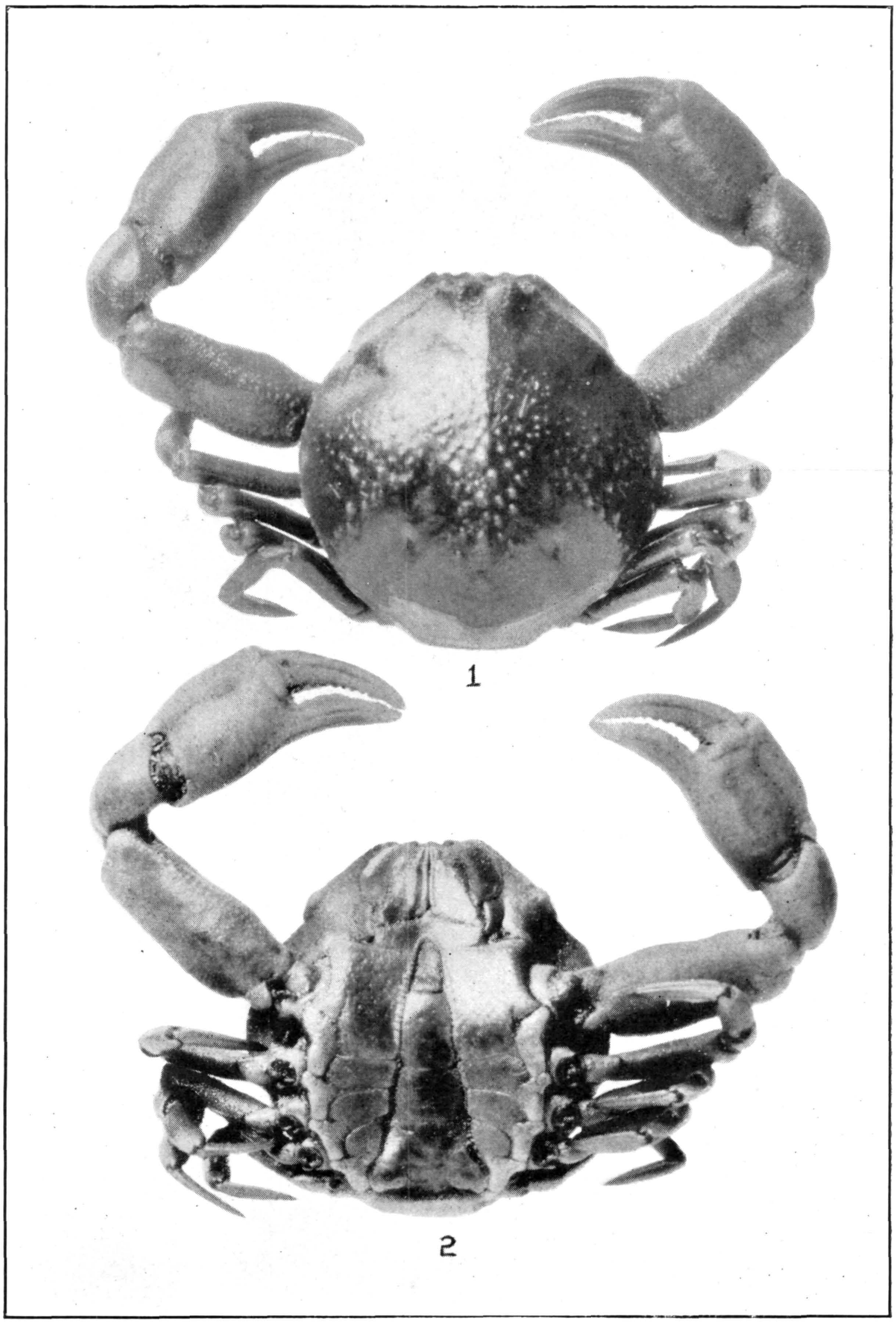
SPECIES OF PERSEPHONA.

1, *P. lichtensteinii*, dorsal view; 2, same, left side of carapace; 3, *P. edwardsii*, female, dorsal view; 4, same,



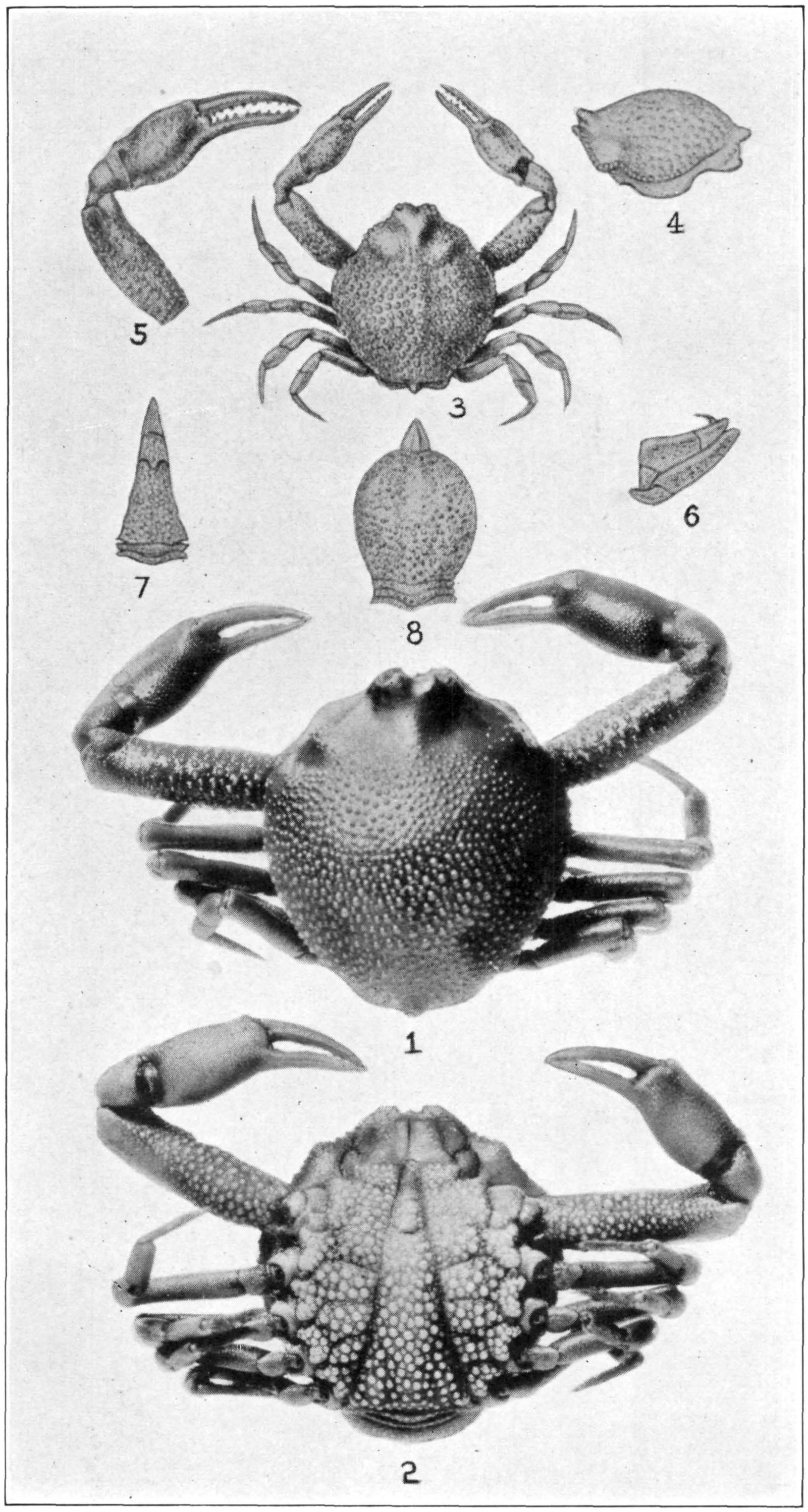
MYROPSIS QUINQUESPINOSA.

1, Male (66484), about one-half natural size, dorsal view; 2, same, ventral view; 3, dorsal view, reduced, of specimen from Copenhagen Museum.



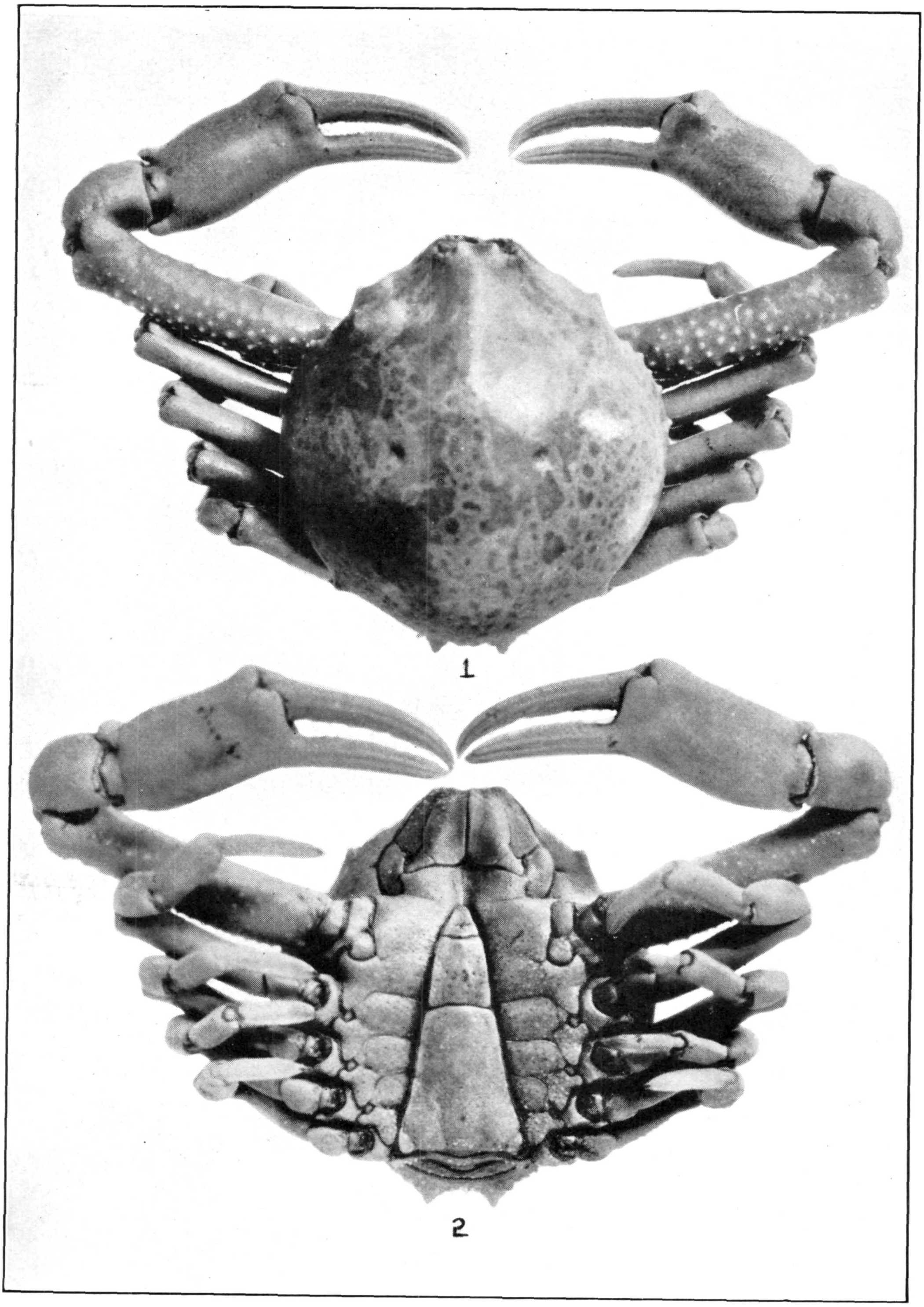
PHILYRA PISUM.

1, Male (45862), × 2, dorsal view; 2, same, ventral view.



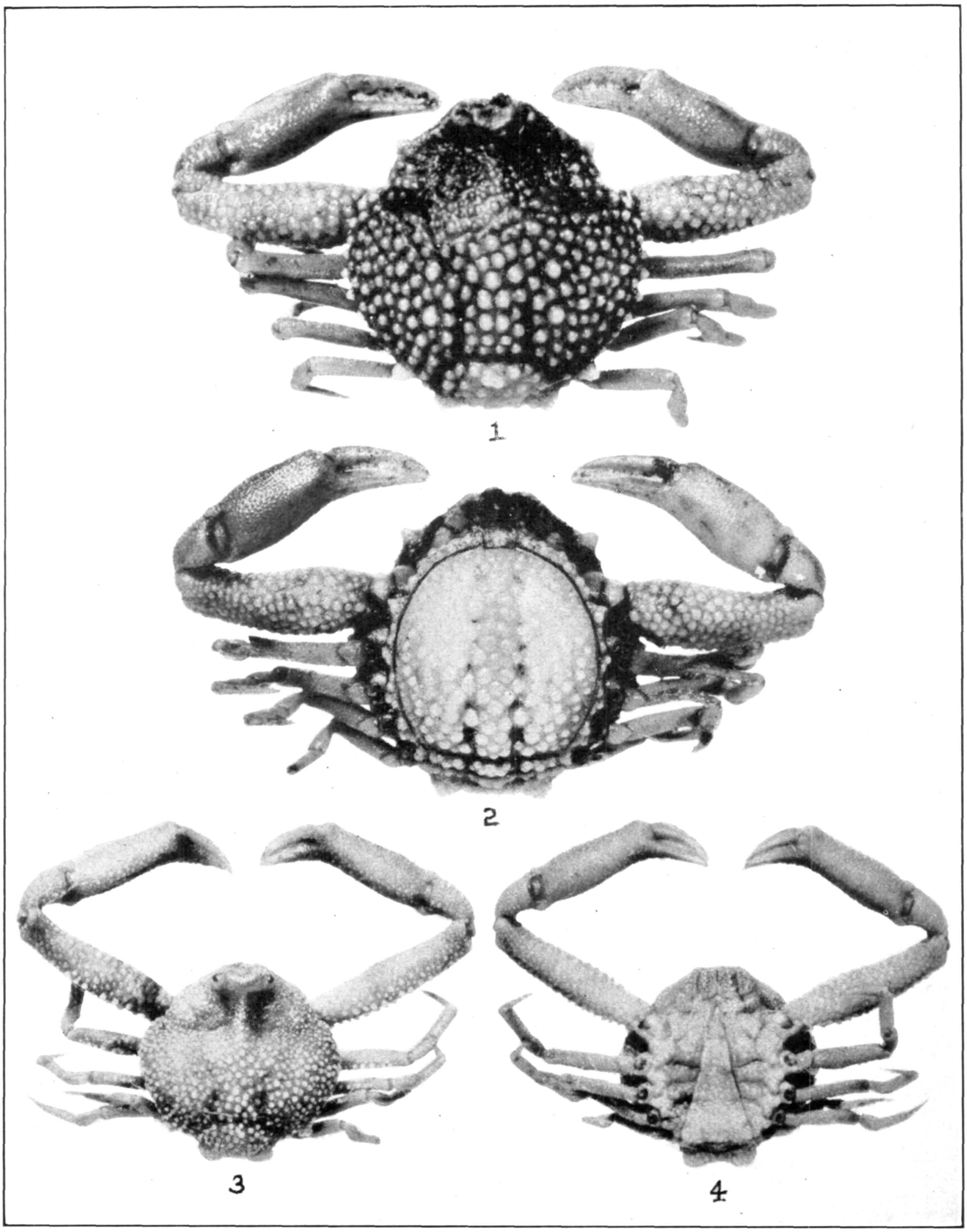
LEUCOSILIA JURINEI.

1, Male (39102), × 2, dorsal view; 2, same, ventral view; 3, dorsal view; 4, left side of carapace; 5, left cheliped; 6, left outer maxilliped; 7, male abdomen; 8, female abdomen. (Figs. 3–8 after Bell.)



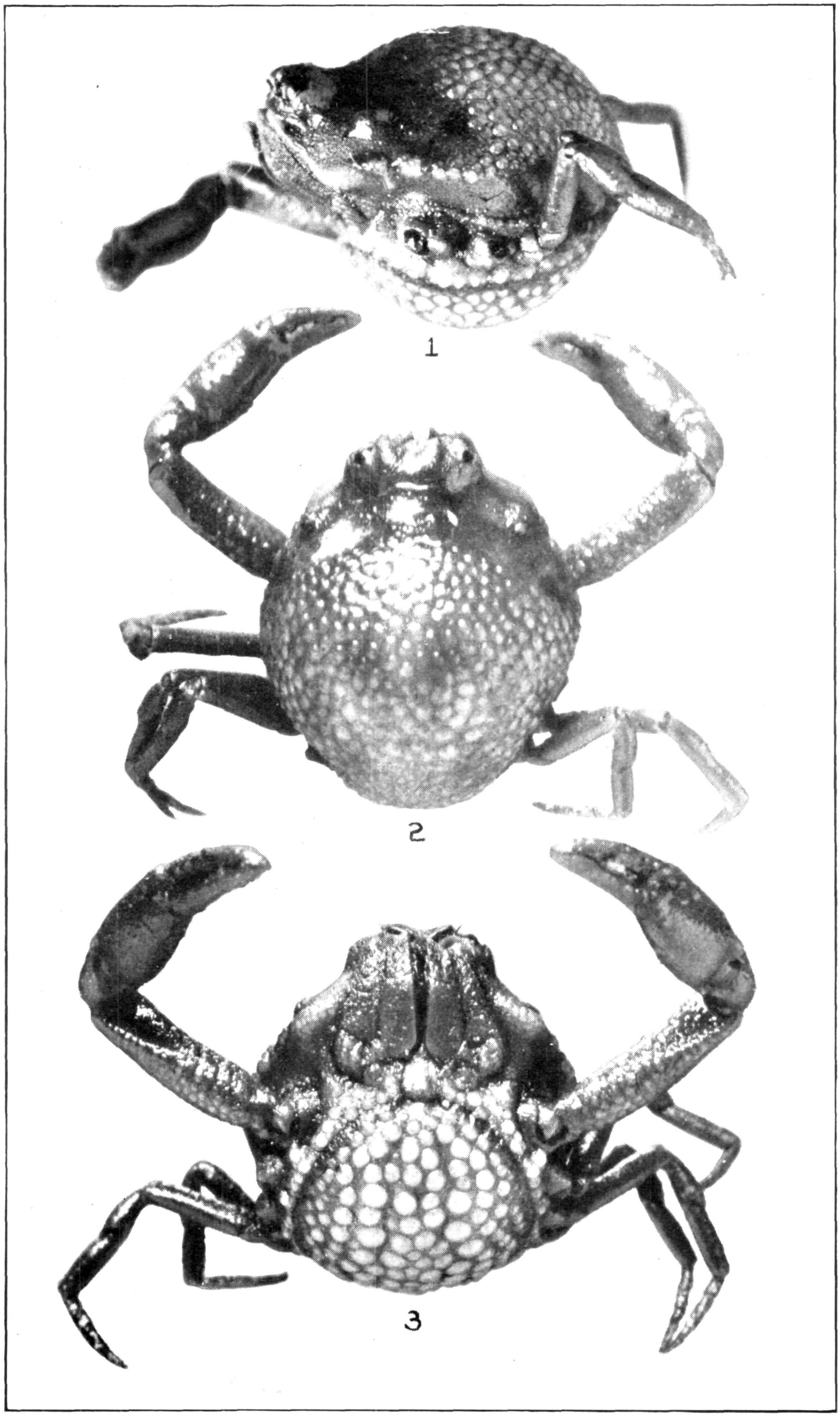
RANDALLIA ORNATA.

1, Male (3101), natural size, dorsal view; 2, same, ventral view.



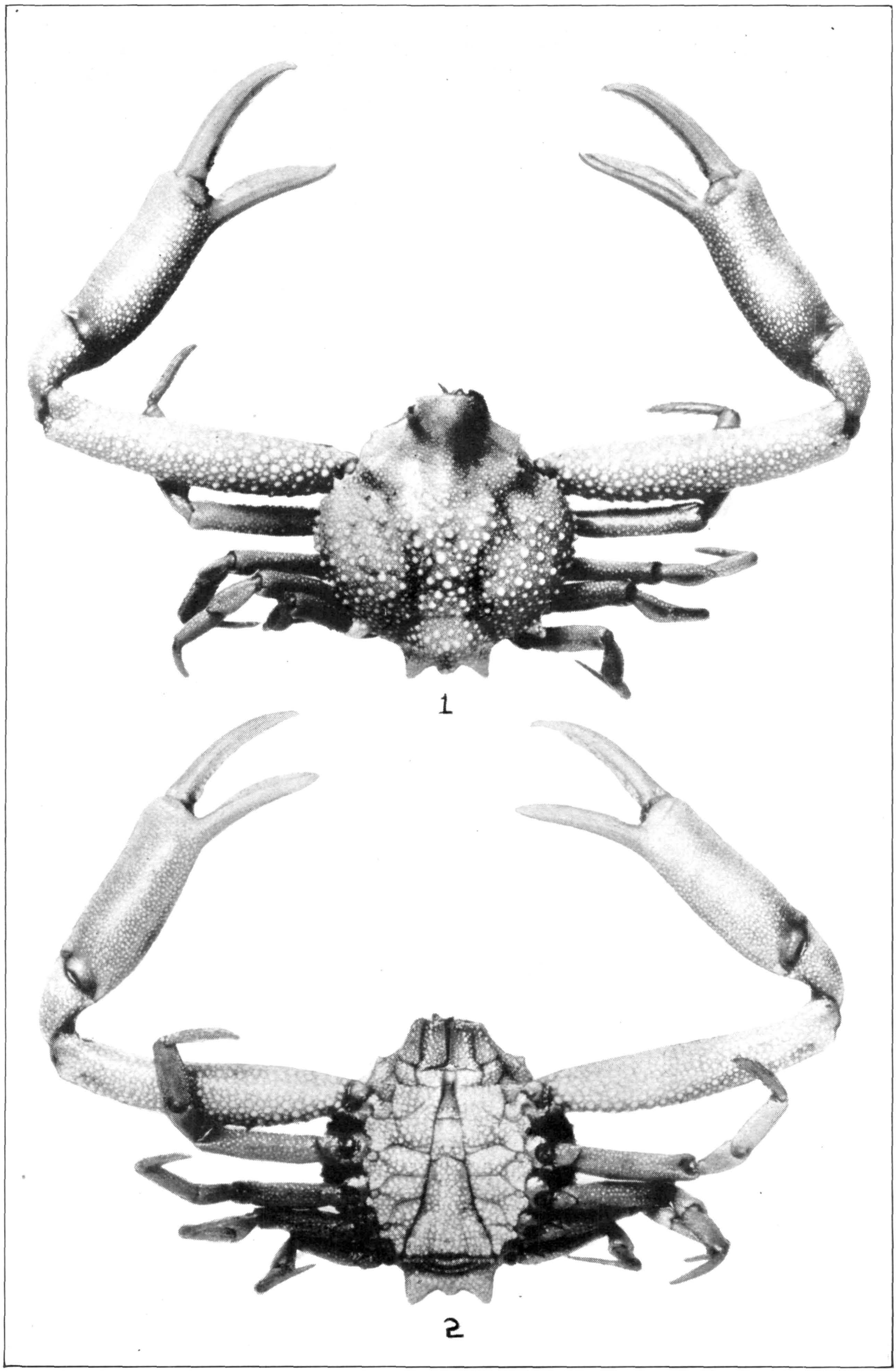
SPECIES OF RANDALLIA.

1, *R. bulligera*, female (66509), × 3, dorsal view; 2, same, ventral view; 3, *R. agaricias*, male holotype (21601), × 3, dorsal view; 4, same, ventral view.



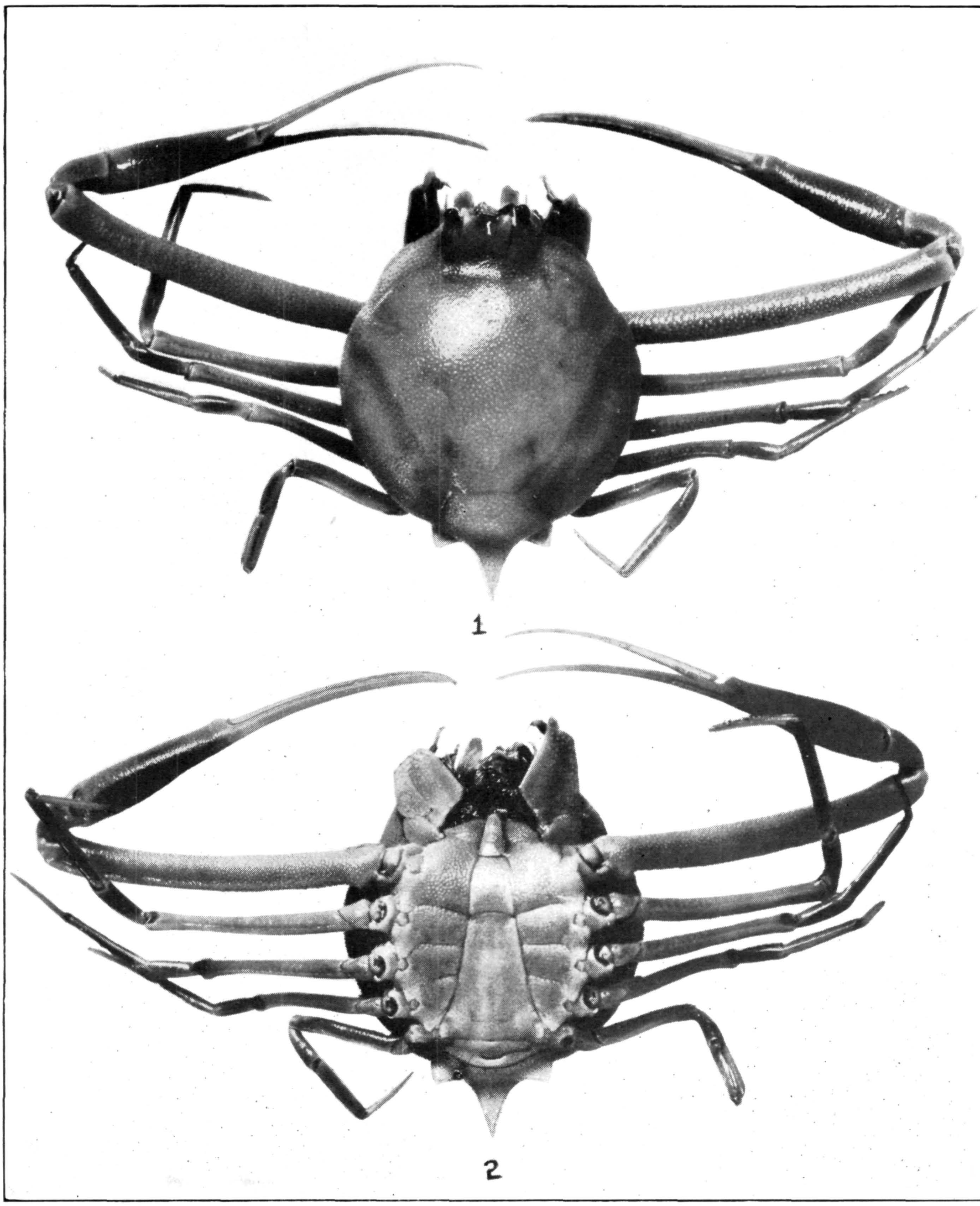
RANDALLIA CURACAOENSIS.

1, Female holotype (56907), 8.4 mm long, left profile; 2, same, dorsal view; 3, same, ventral view.



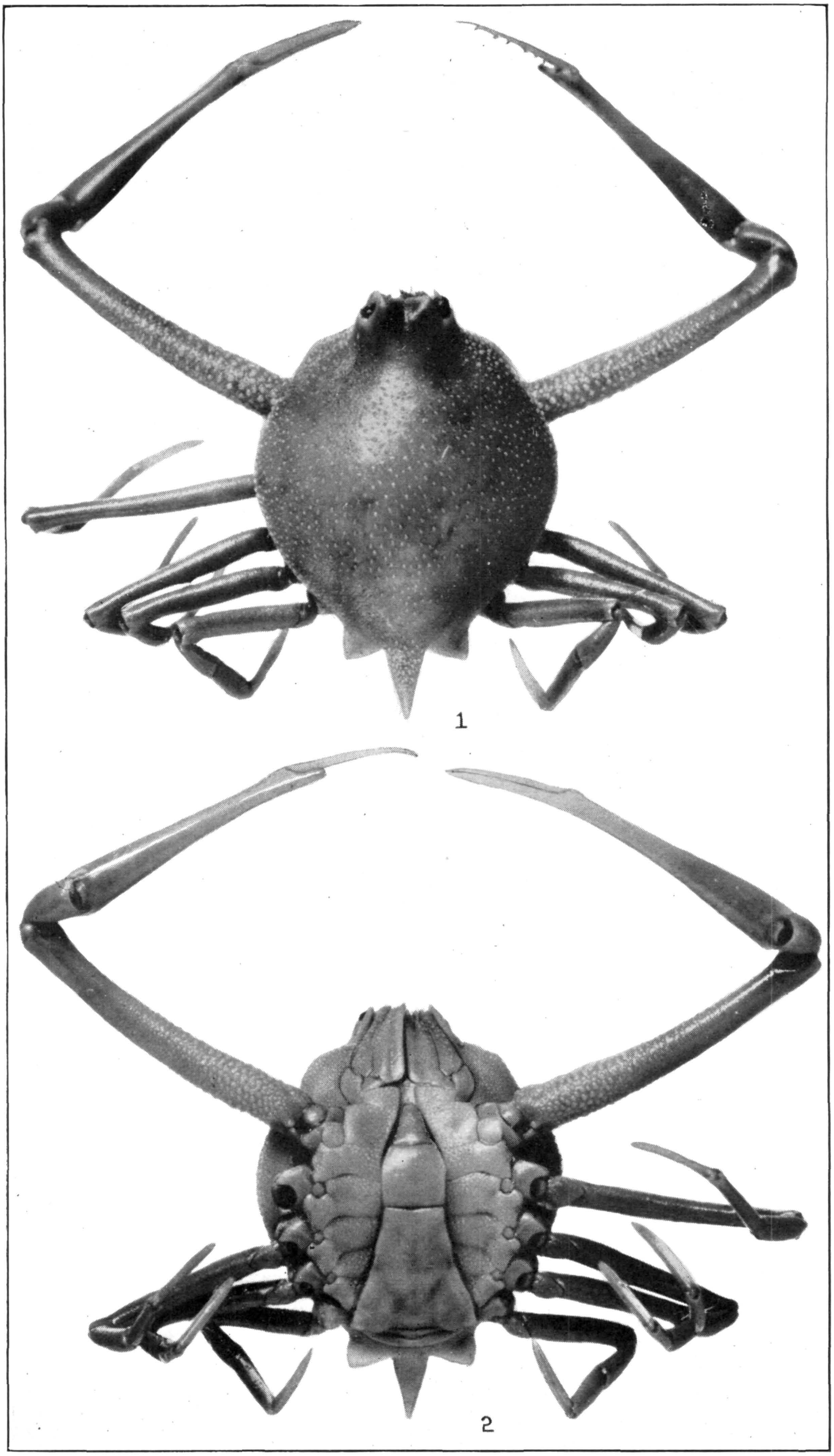
RANDALLIA AMERICANA.

1, Male holotype (17388), × 3, dorsal view; 2, same, ventral view.



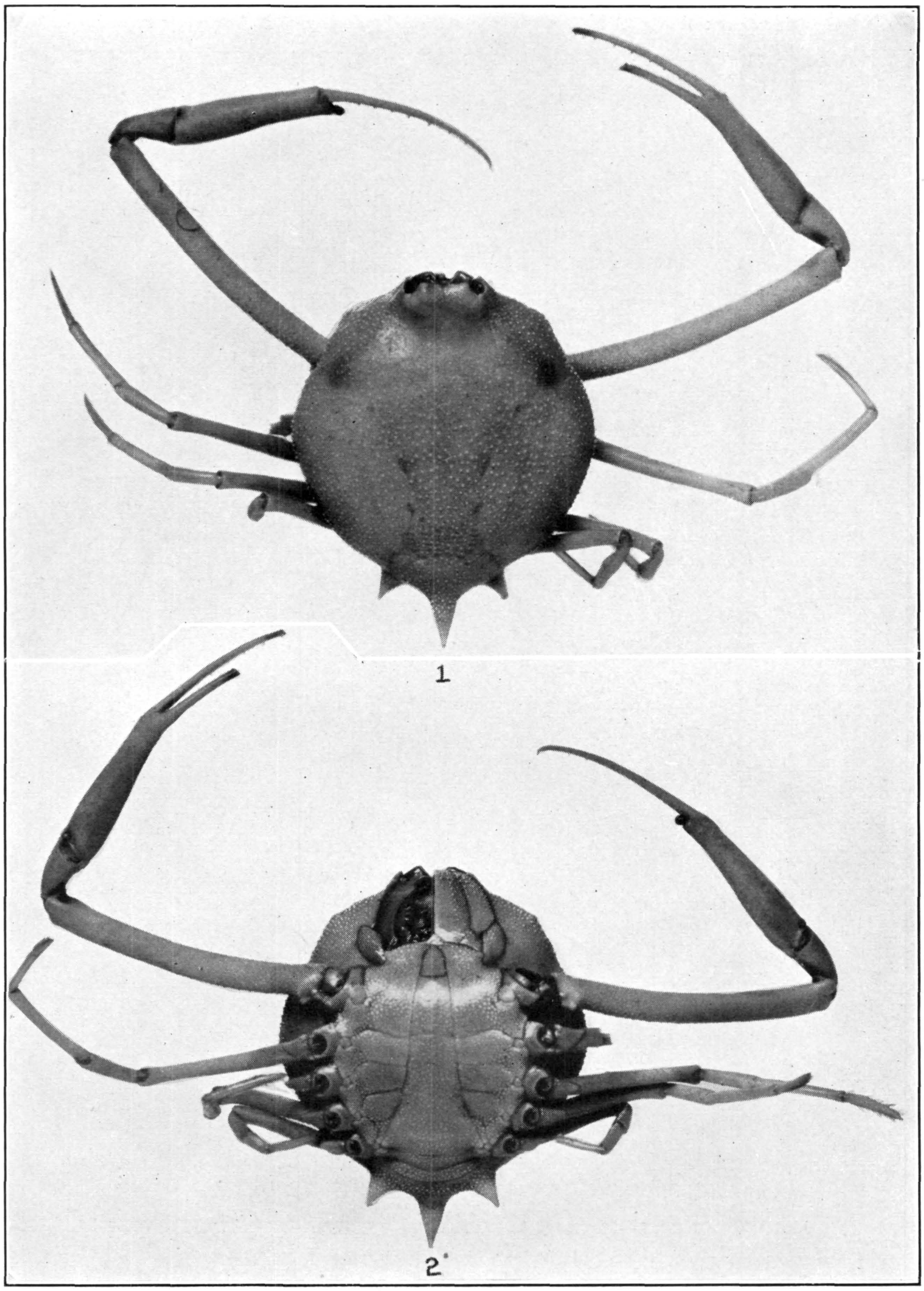
ILIACANTHA SUBGLOBOSA.

1, Male (55193), × 3, dorsal view; 2, same, ventral view.



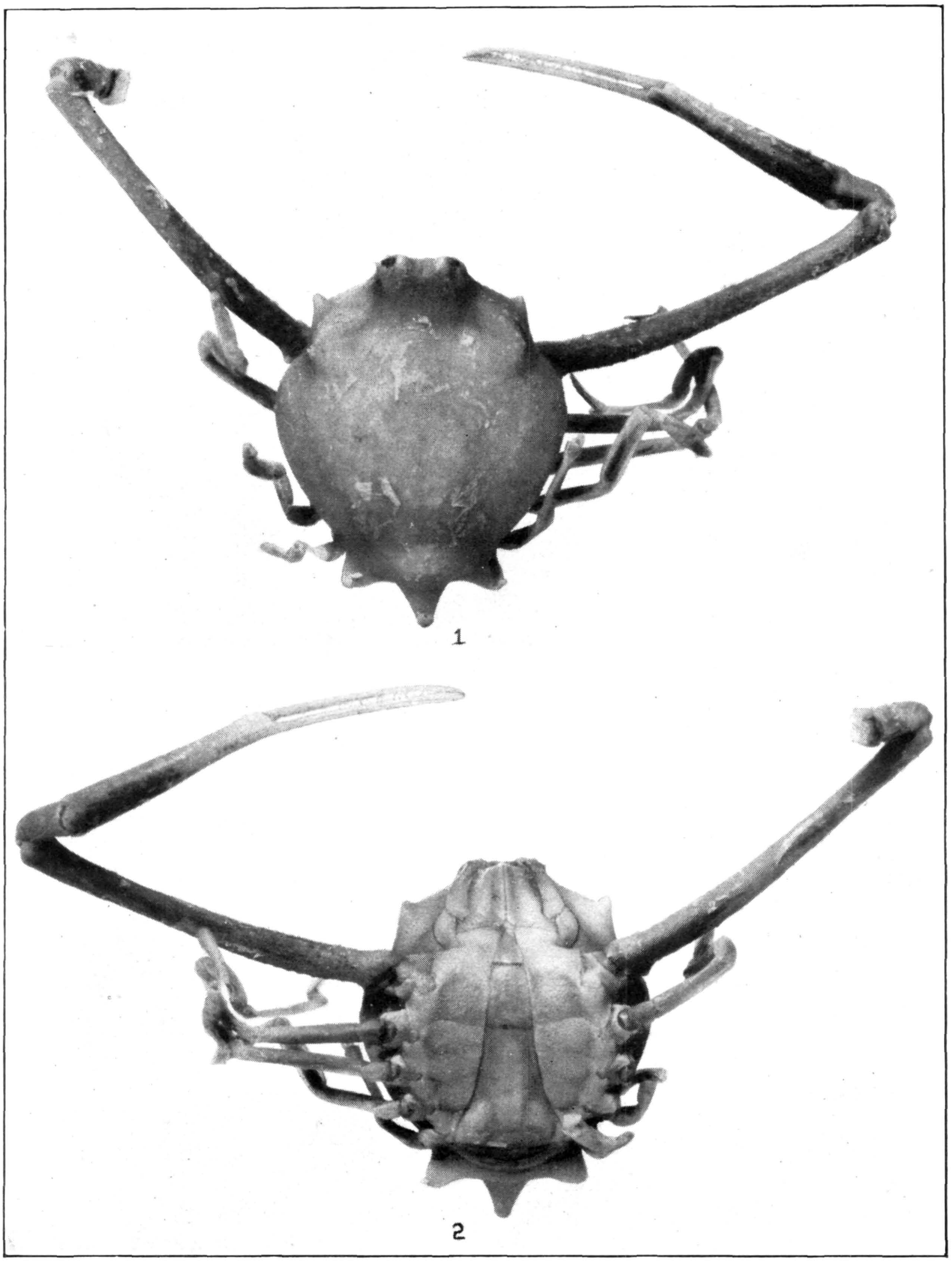
ILIACANTHA INTERMEDIA.

1, Male (55189), × 2⅝, dorsal view; 2, same, ventral view.



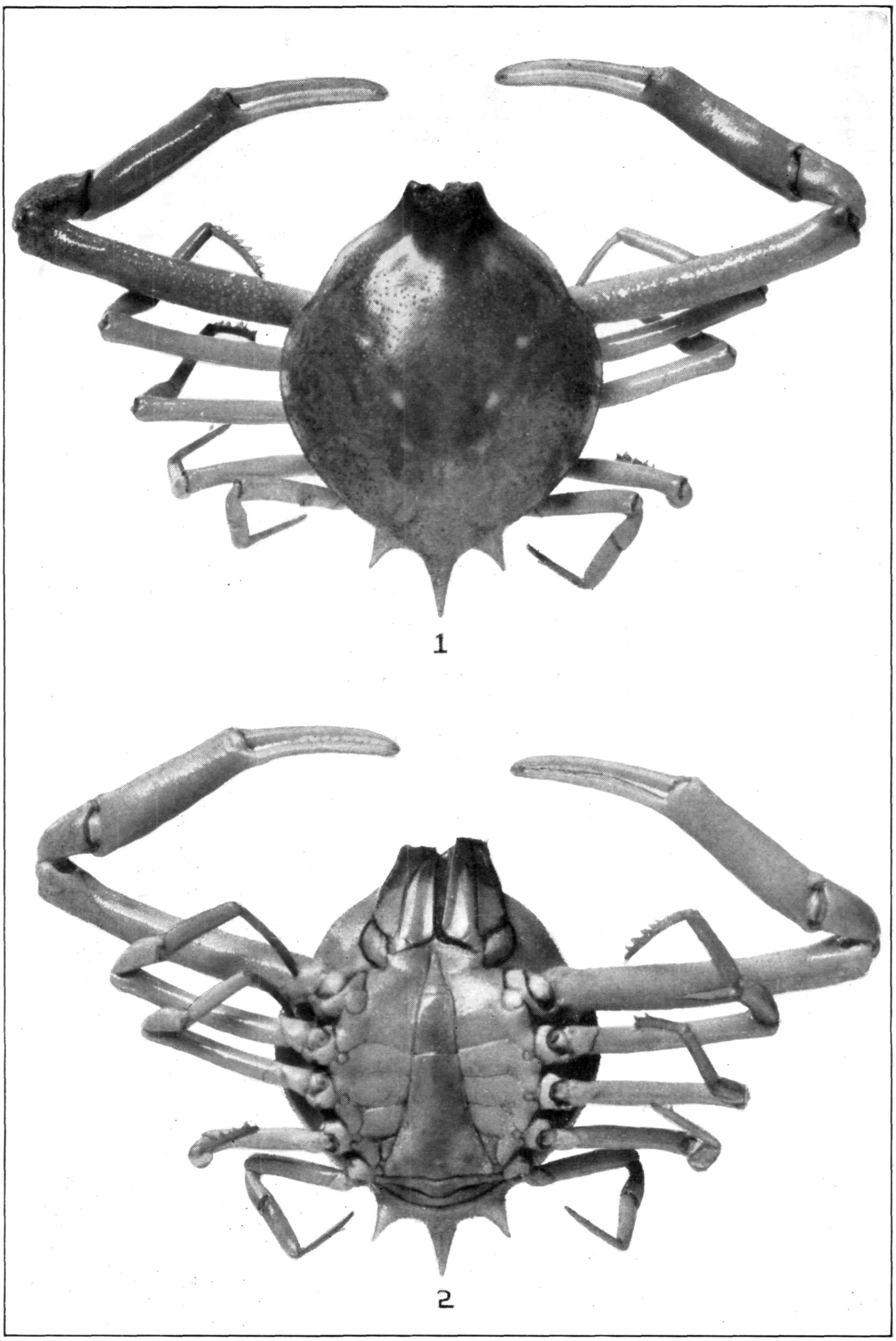
ILIACANTHA LIODACTYLUS.

1, Male holotype (20327), × 2⁷⁄₁₀, dorsal view; 2, same, ventral view.



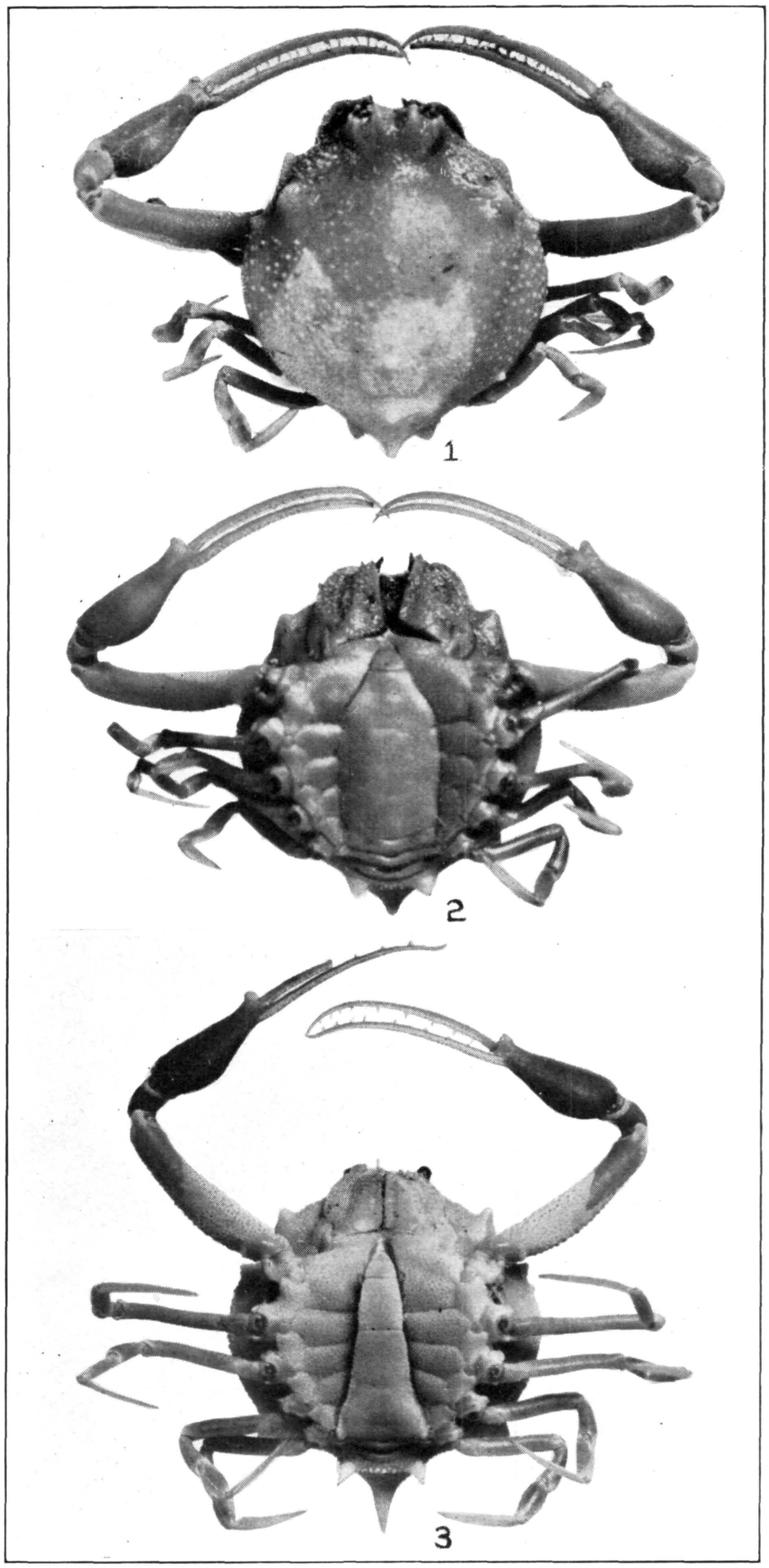
ILIACANTHA SPARSA.

1, Male (11020), × 2¼, dorsal view; 2, same, ventral view.



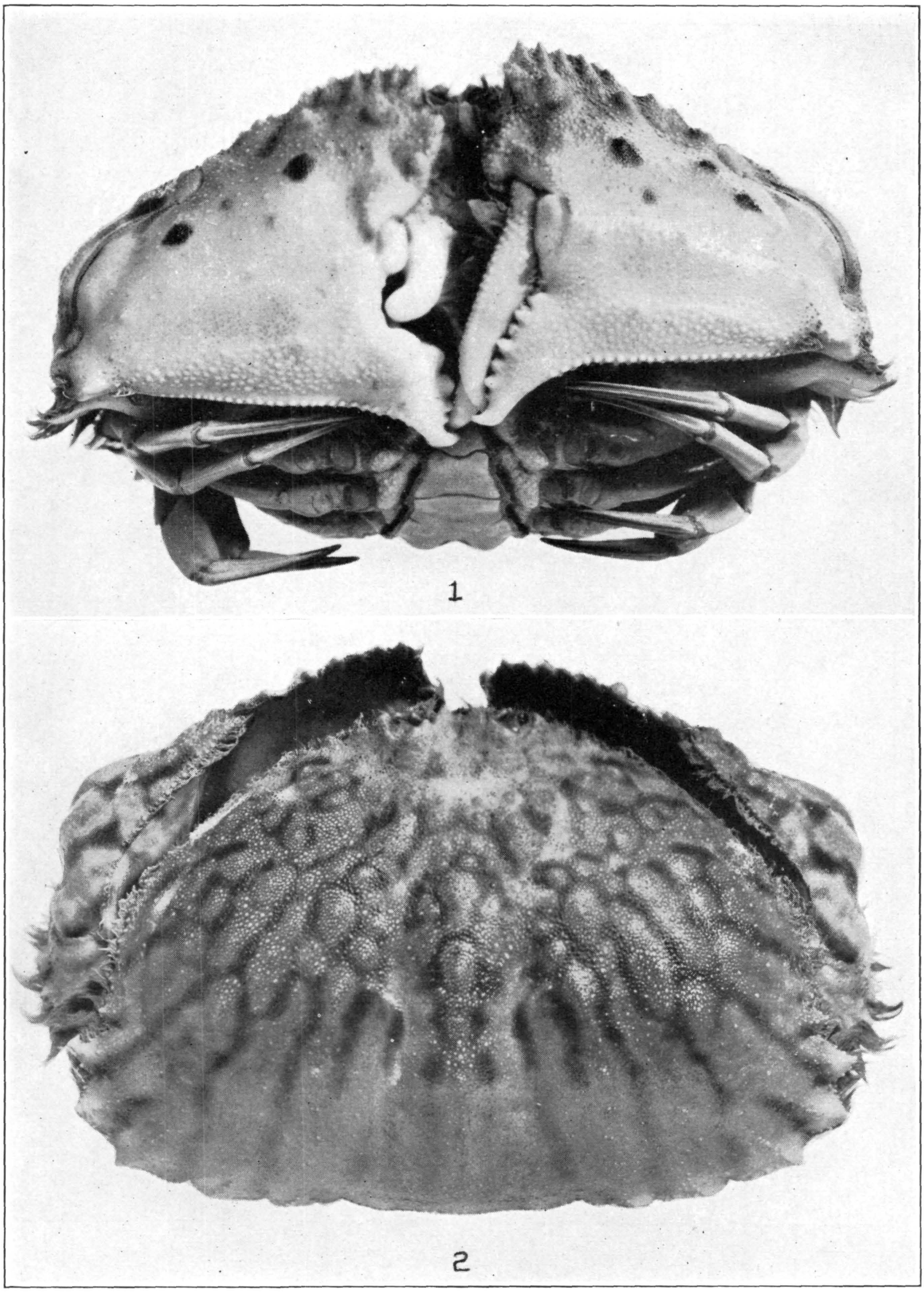
ILIACANTHA HANCOCKI.

1, Male holotype (69260), dorsal view; 2, same, ventral view.



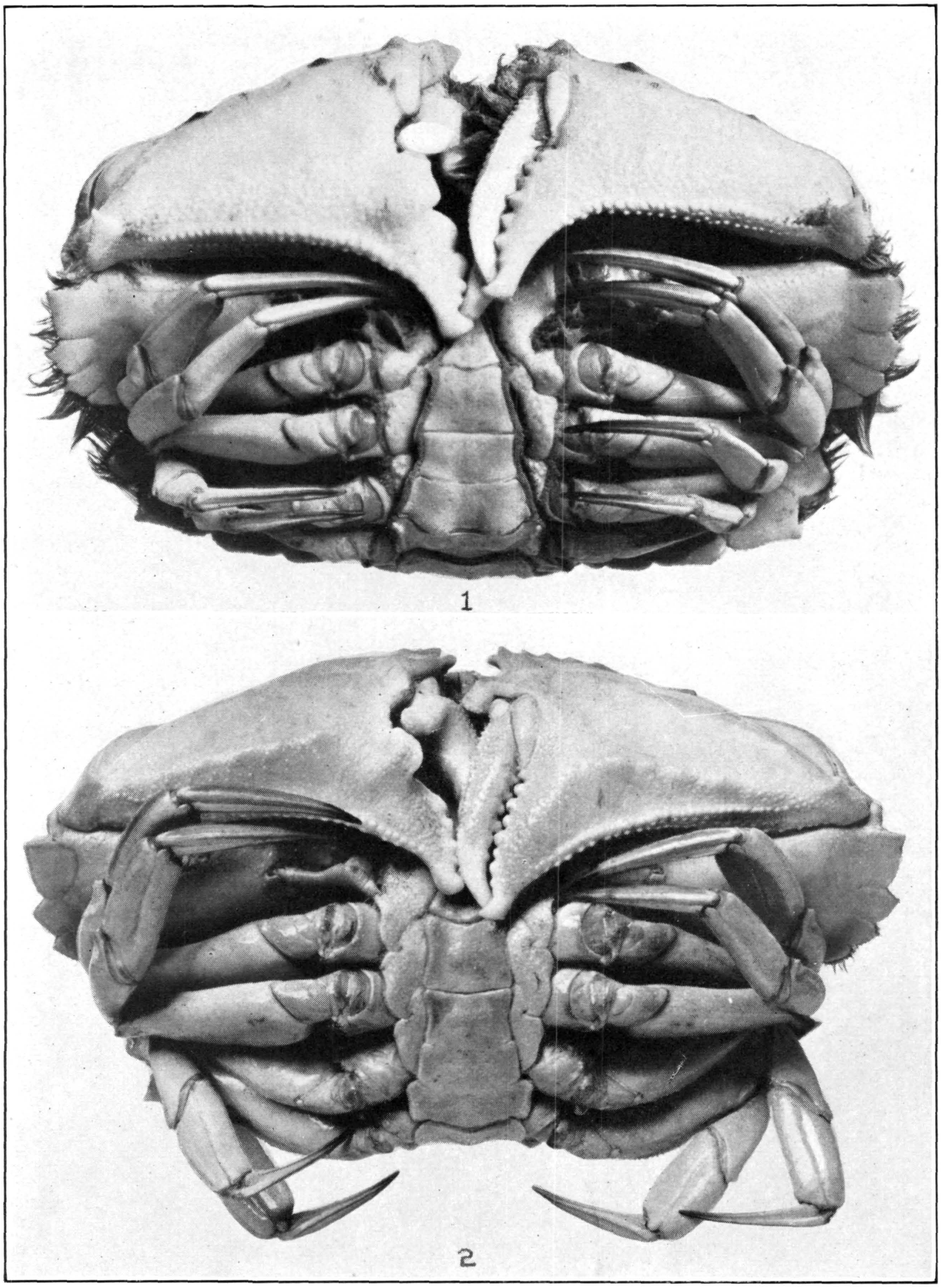
CALLIDACTYLUS ASPER.

1, Female (55194), × 3, dorsal view; 2, same, ventral view, immature; 3, male (55183), × 3, ventral view.



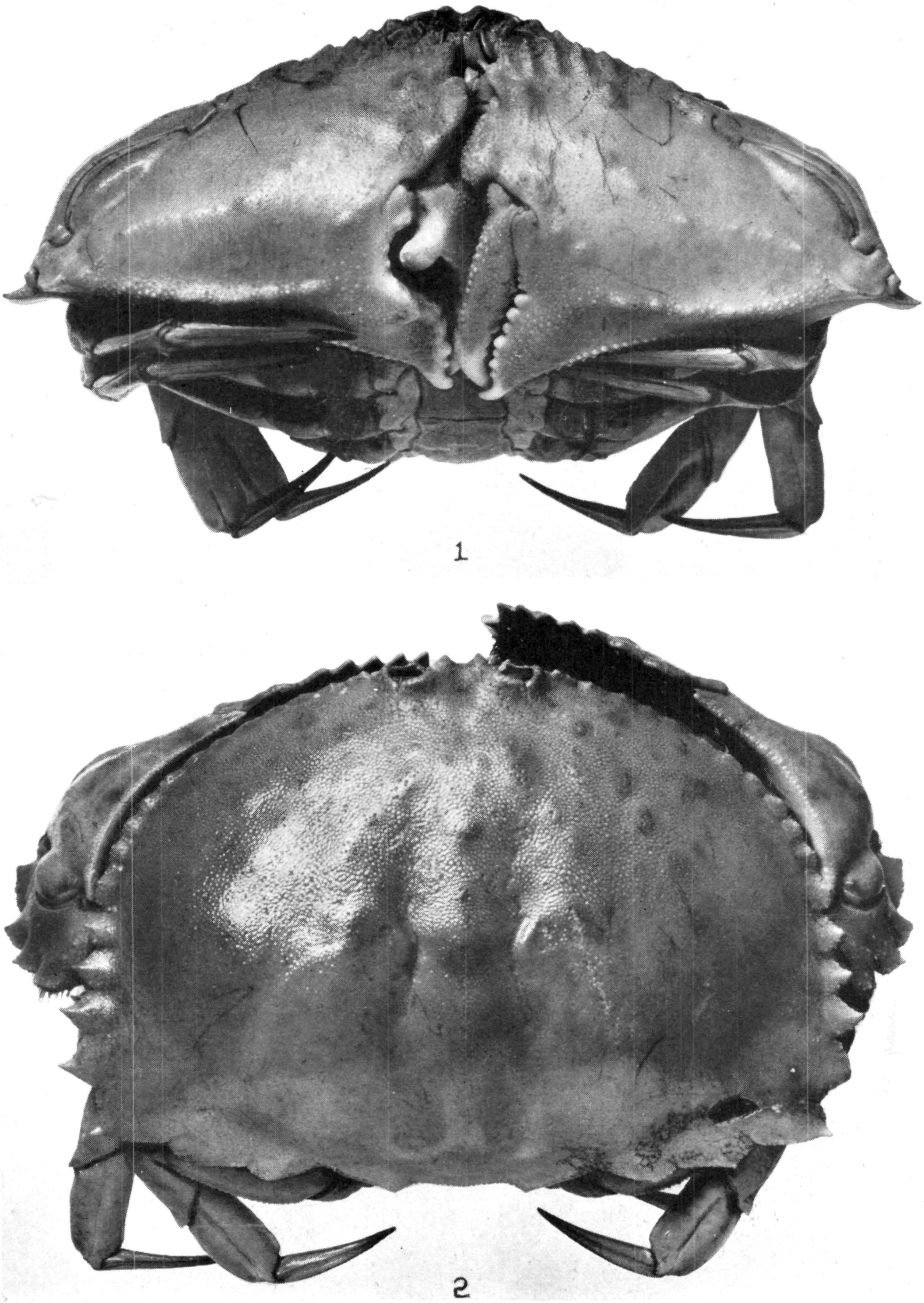
CALAPPA FLAMMEA.

1, Male (66366), two-thirds natural size, ventral view for chelae; 2, same, dorsal view.



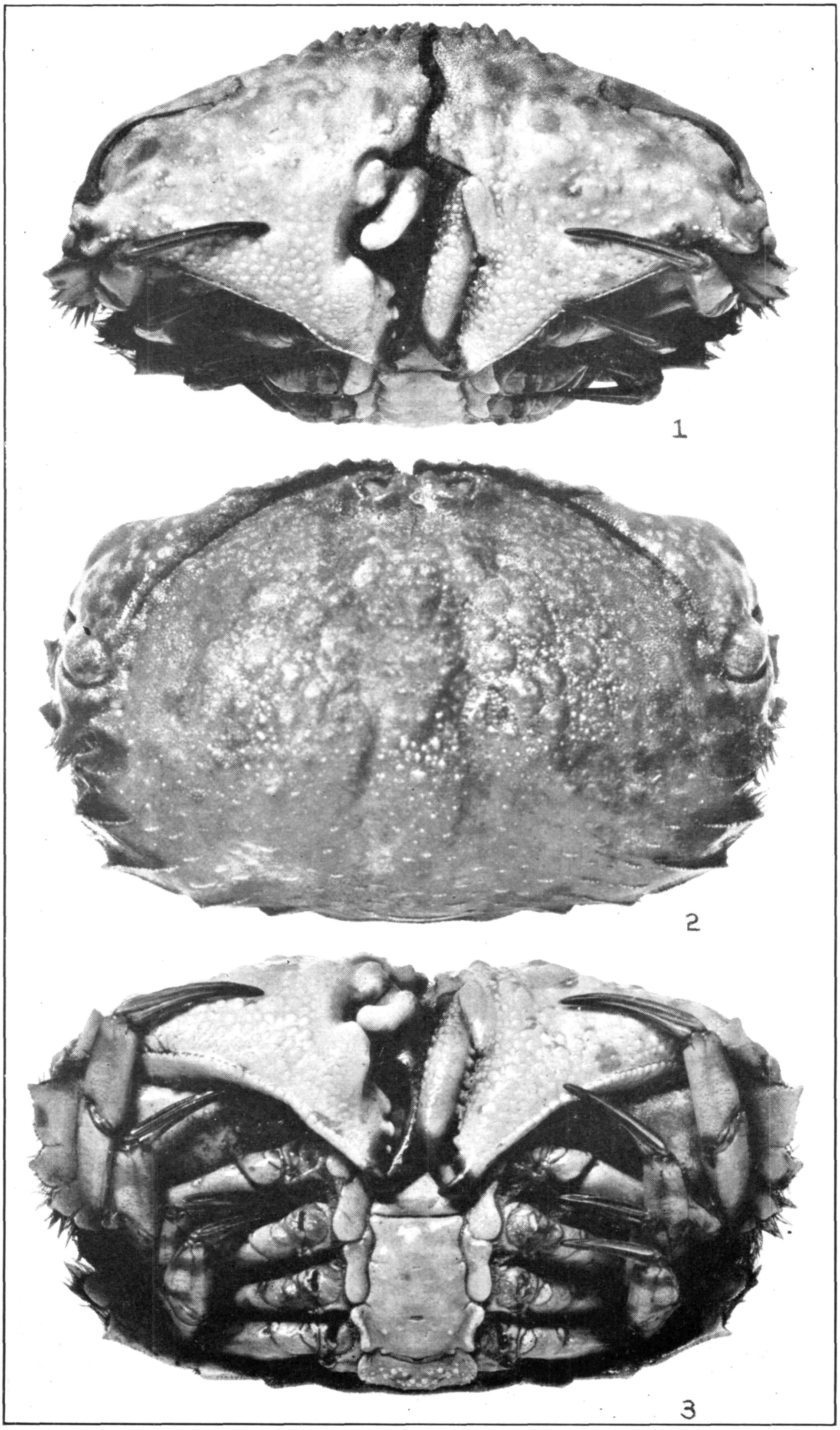
SPECIES OF CALAPPA.

1, *C. flammea*, male (66366), three-fifths natural size, ventral view for abdomen; 2, *C. springeri*, male (66383), about one-half natural size, ventral view for abdomen.



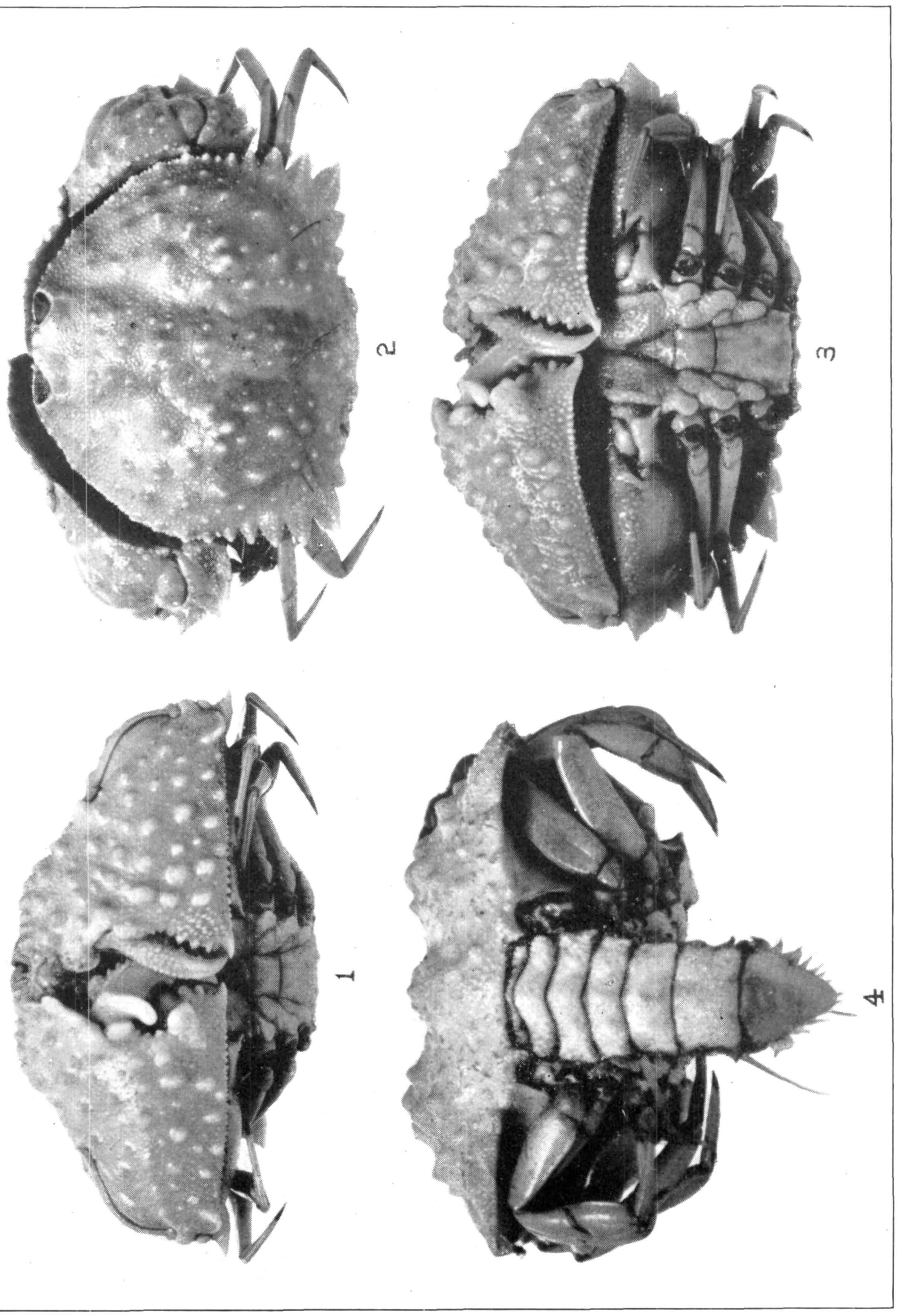
CALAPPA SPRINGERI.

1, Male (66383), one-half natural size, ventral view for chelae; 2, same, dorsal view.



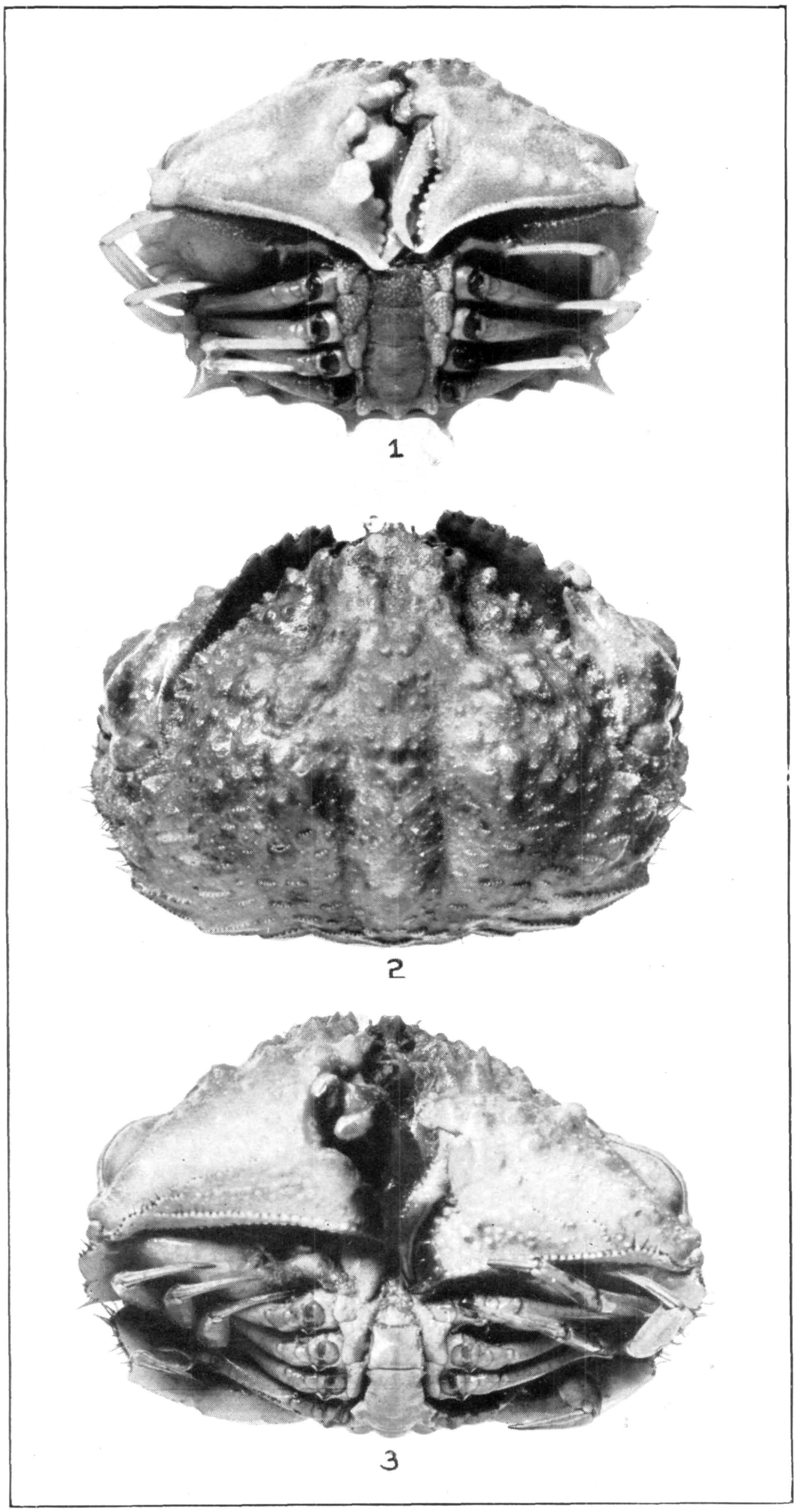
CALAPPA CONVEXA.

1, Male (66510), two-thirds natural size, ventral view for chelae; 2, same, dorsal view; 3, same, ventral for abdomen.



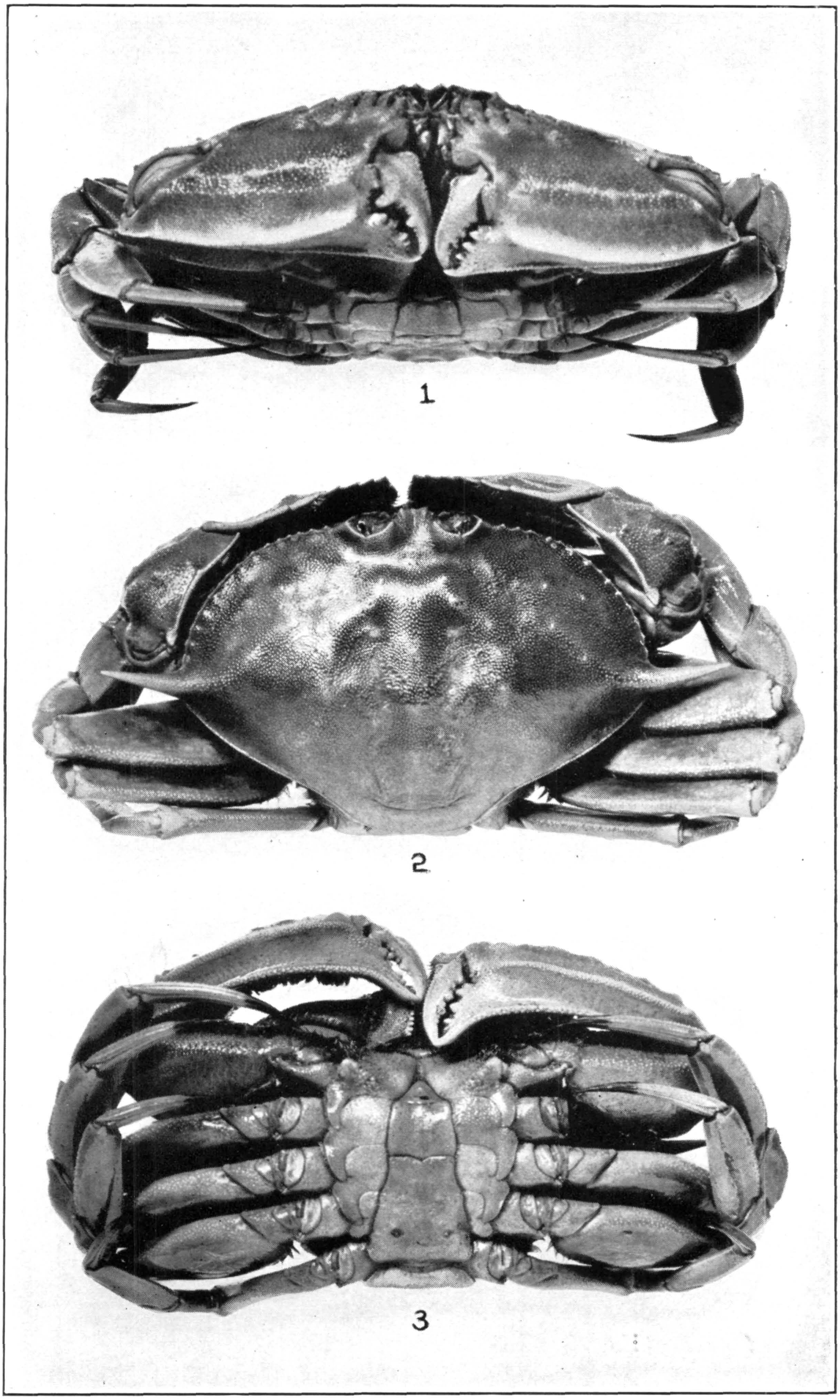
CALAPPA SAUSSUREI.

1, Male holotype (21596), × 2, ventral view for chelae; 2, same, dorsal view; 3, same, ventral view for abdomen; 4, female, Mexico (Calif Acad. Sci.), × 2½ (approximately), posterior view showing abdomen, terminal segment slightly foreshortened.



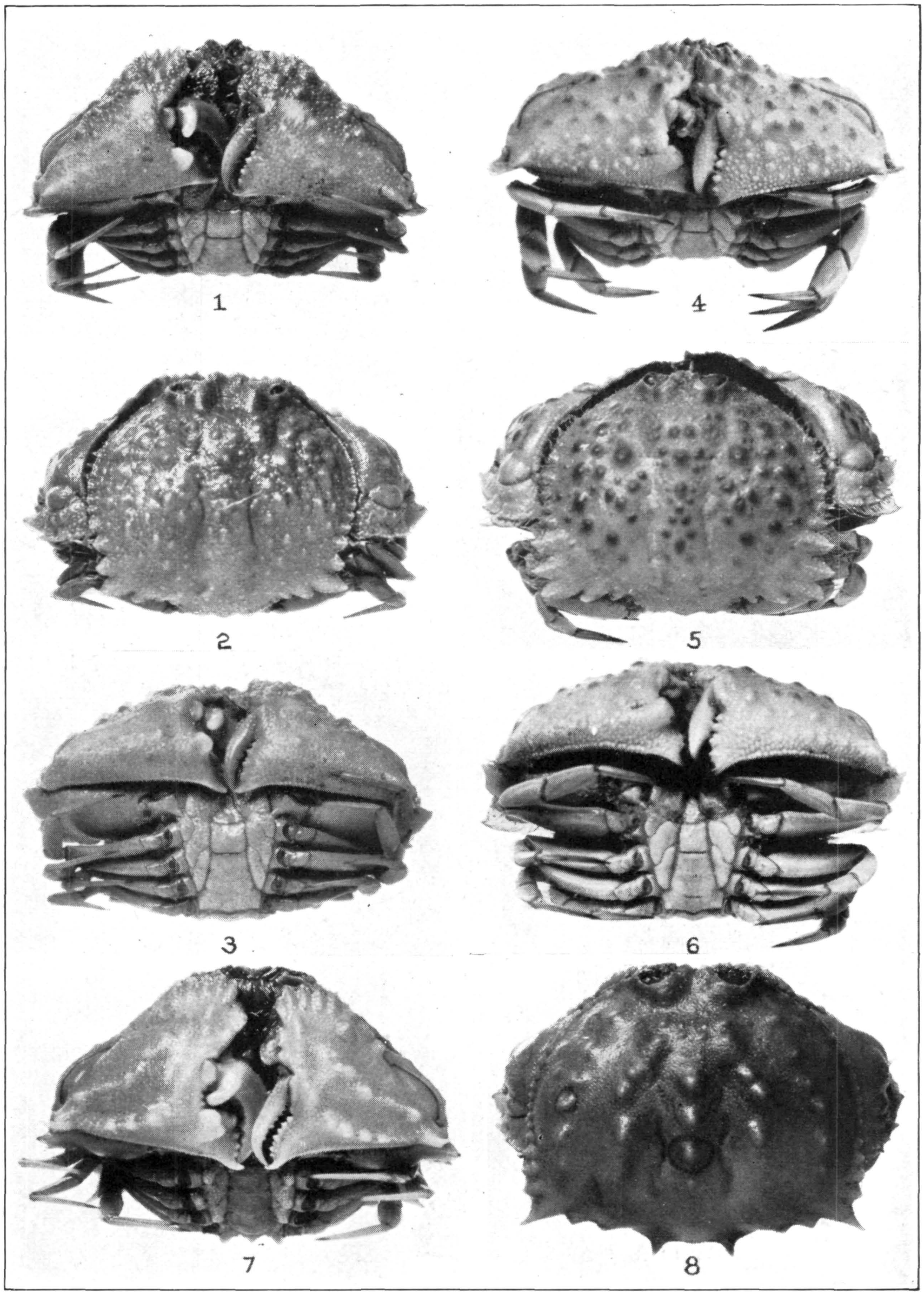
SPECIES OF CALAPPA.

1, *C. sulcata*, male (24079), × 2, ventral view for abdomen; 2, *C. gallus*, male (66368), natural size, dorsal view; 3, same, ventral view.



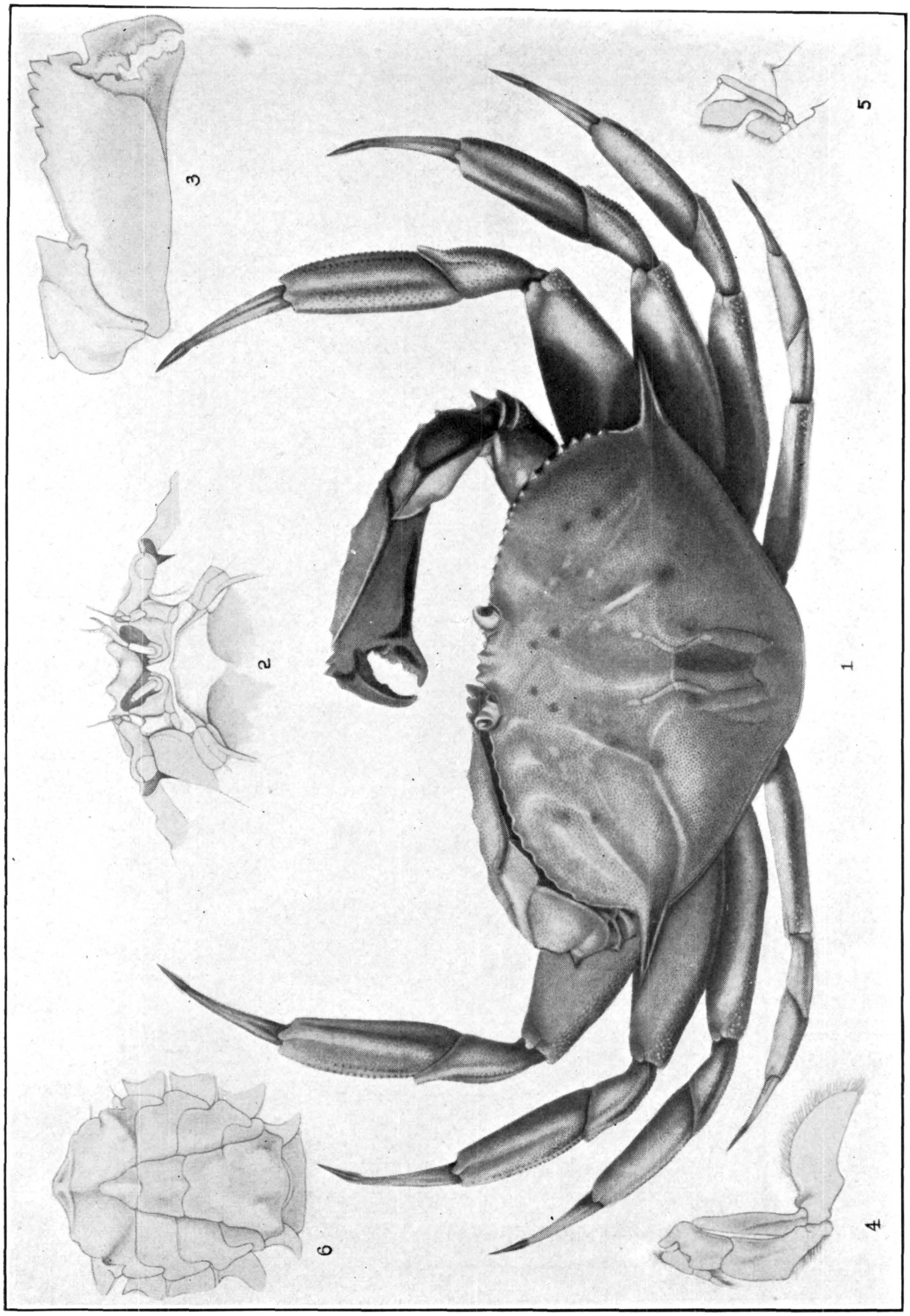
MURSIA GAUDICHAUDII.

1, Male (15607), two-thirds natural size, ventral view for chelae; 2, same, dorsal view; 3, same, ventral view for abdomen.



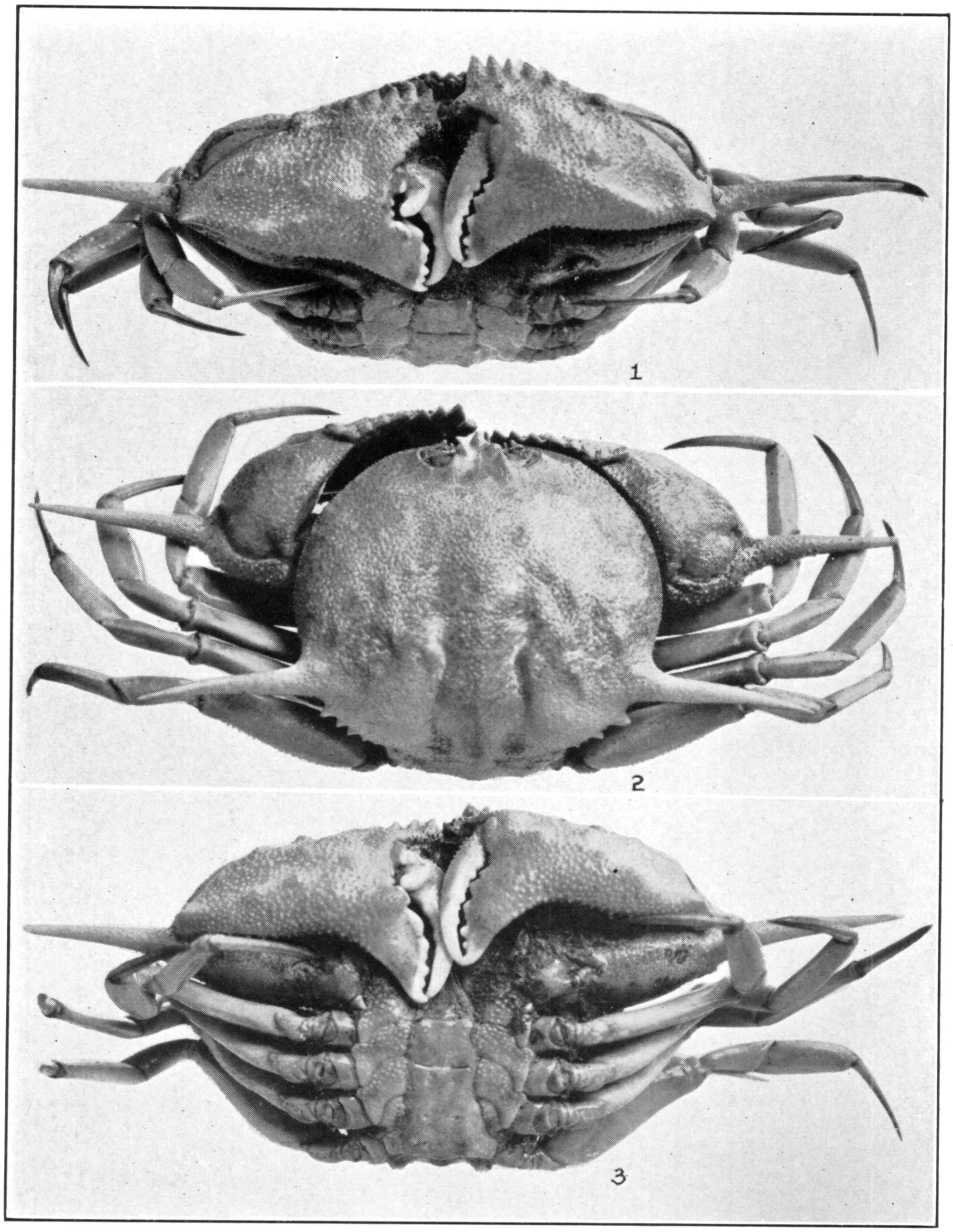
SPECIES OF CALAPPA.

1, *C. angusta*, young male (51070), × 1⅔, ventral view for chelae; 2, same, dorsal view; 3, same ventral view for abdomen; 4, *C. angusta*, adult male holotype (66382), five-sixths natural size, ventral view for chelae; 5, same, dorsal view; 6, same, ventral view for abdomen; 7, *C. sulcata*, male (24079), × 1⅔, ventral view for chelae; 8, same, dorsal view.



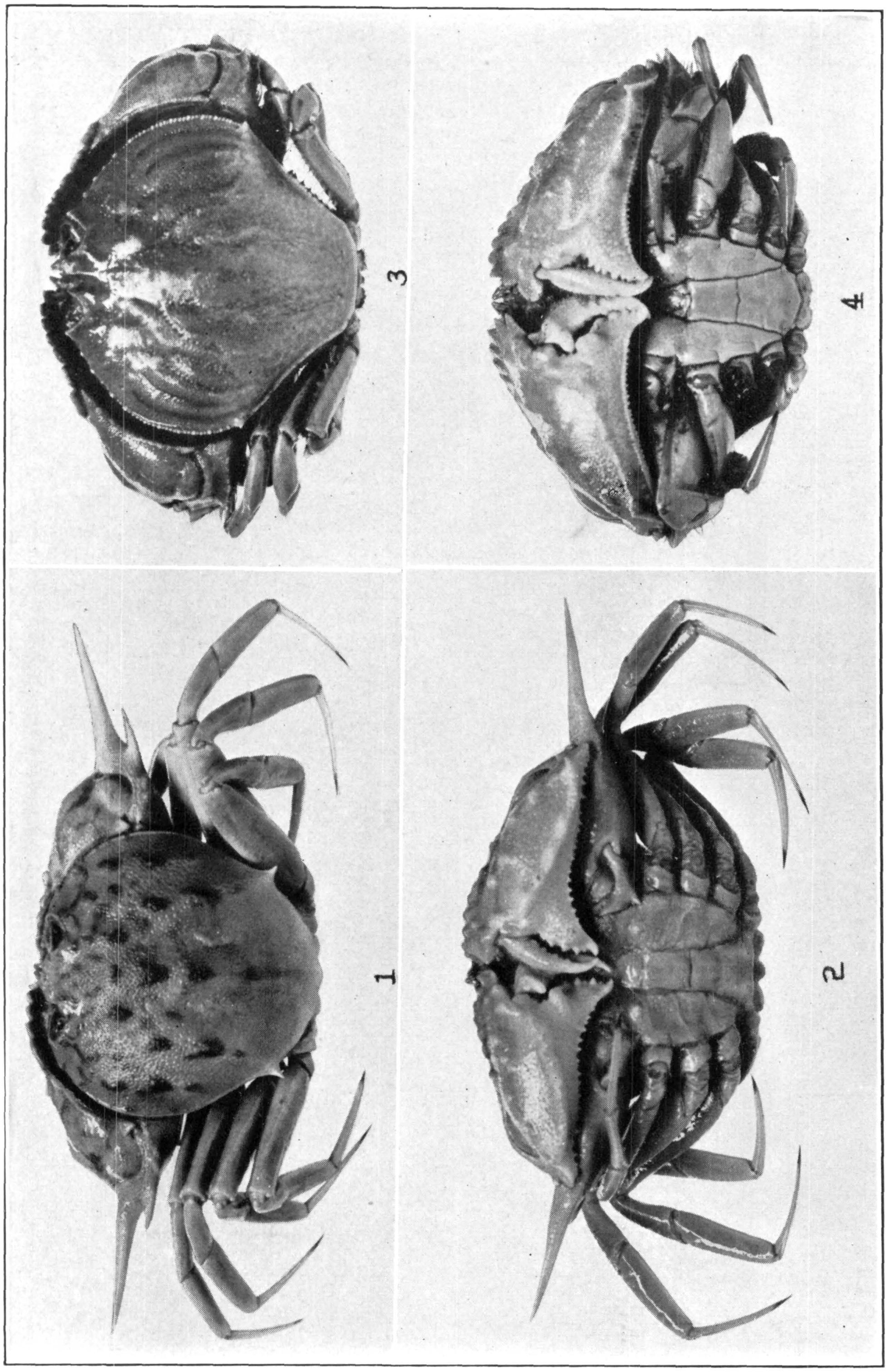
MURSIA GAUDICHAUDII.

1, Dorsal view, reduced; 2, antennal and epistomial regions, enlarged; 3, outer face of chela and carpus; 4, outer maxilliped; 5, first maxilliped; 6, male sternum and abdomen. (After d'Orbigny.)



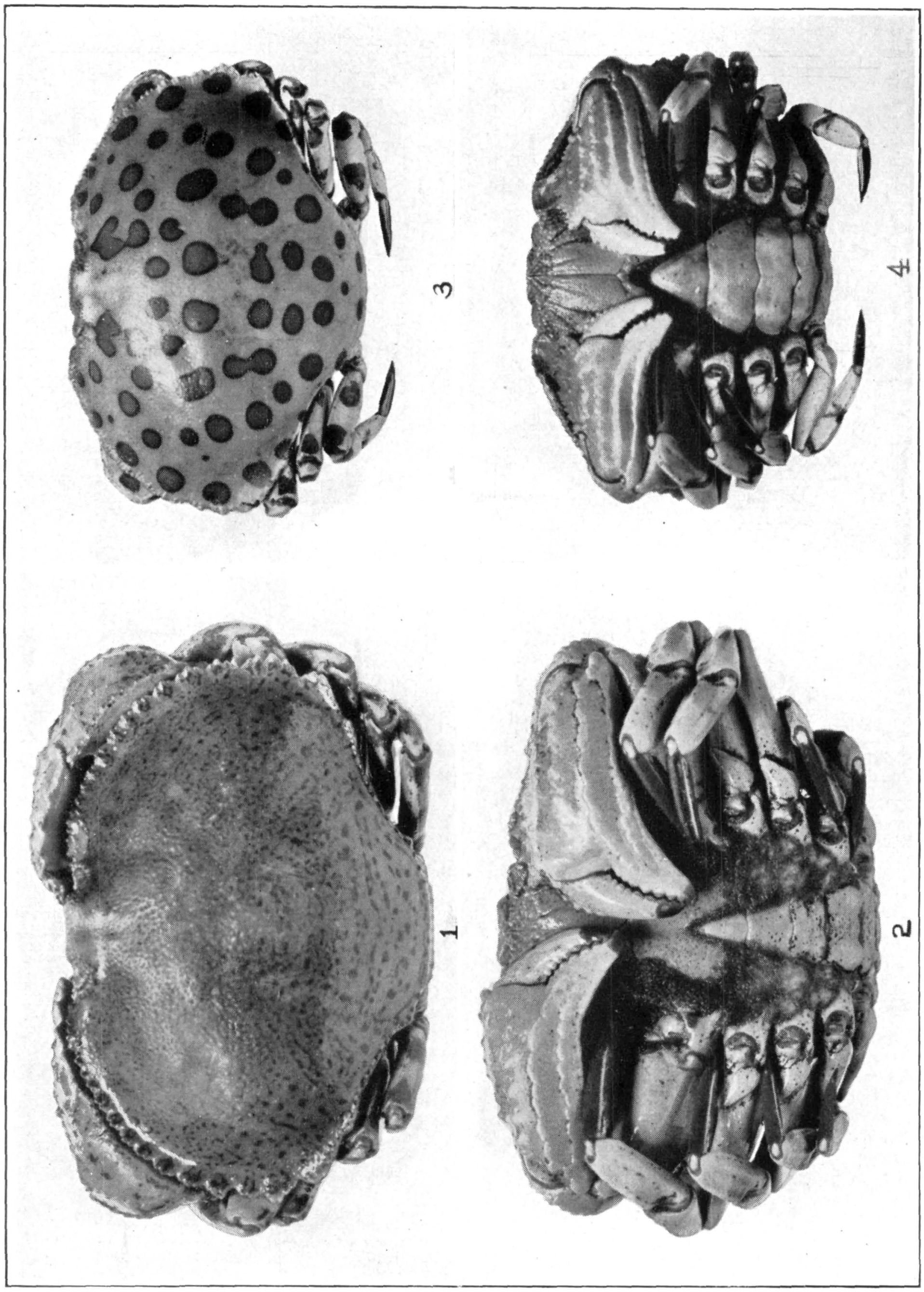
ACANTHOCARPUS BISPINOSUS.

1, Male (66389), reduced, ventral view for chelae; 2, same, dorsal view; 3, same, ventral view for abdomen.



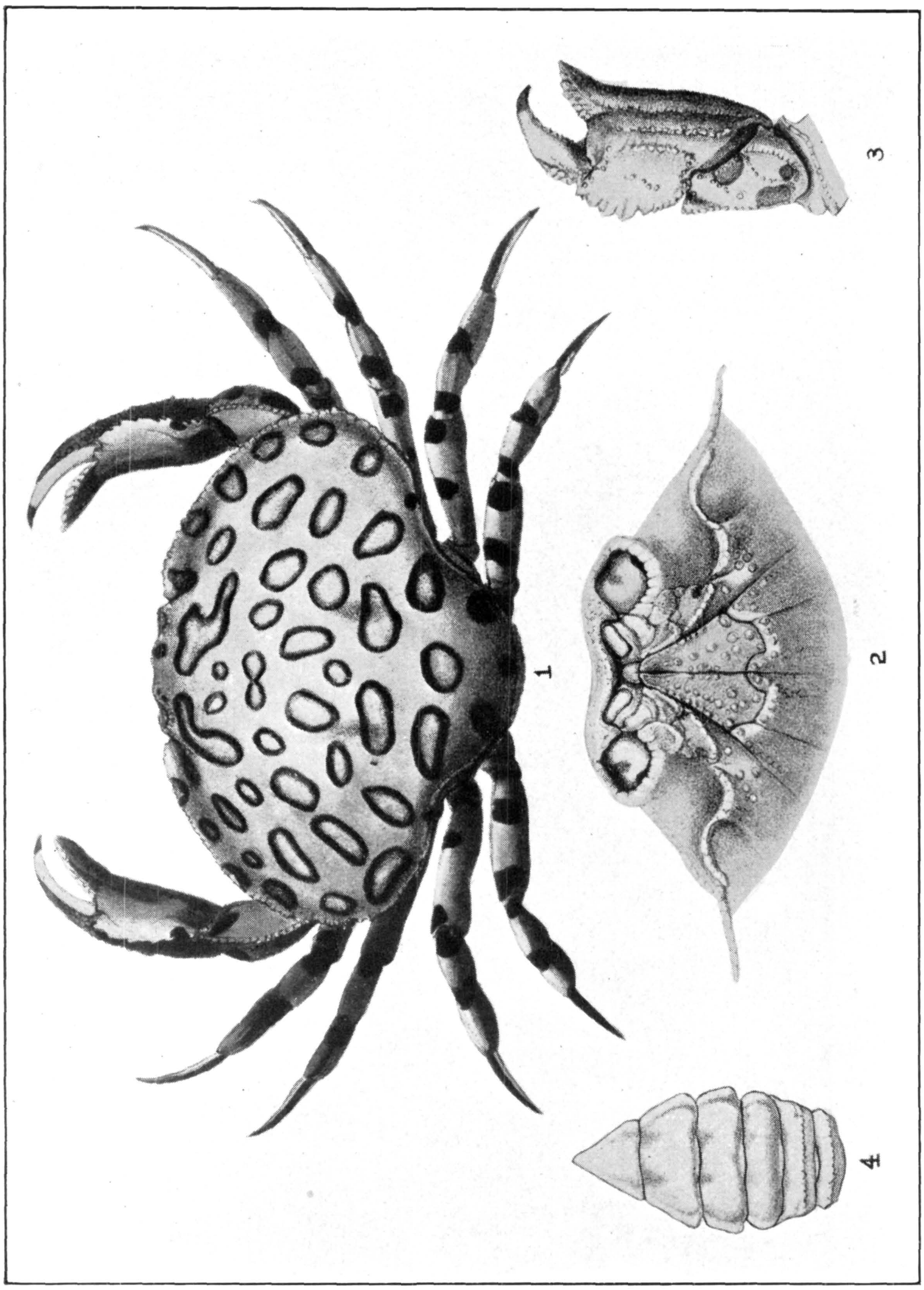
ACANTHOCARPUS ALEXANDRI AND CYCLOËS BAIRDII.

1, *Acanthocarpus alexandri*, male (66401), natural size, dorsal view; 2, same, ventral view; 3, *Cycloës bairdii*, male (66444), natural size, dorsal view; 4, same, ventral view.



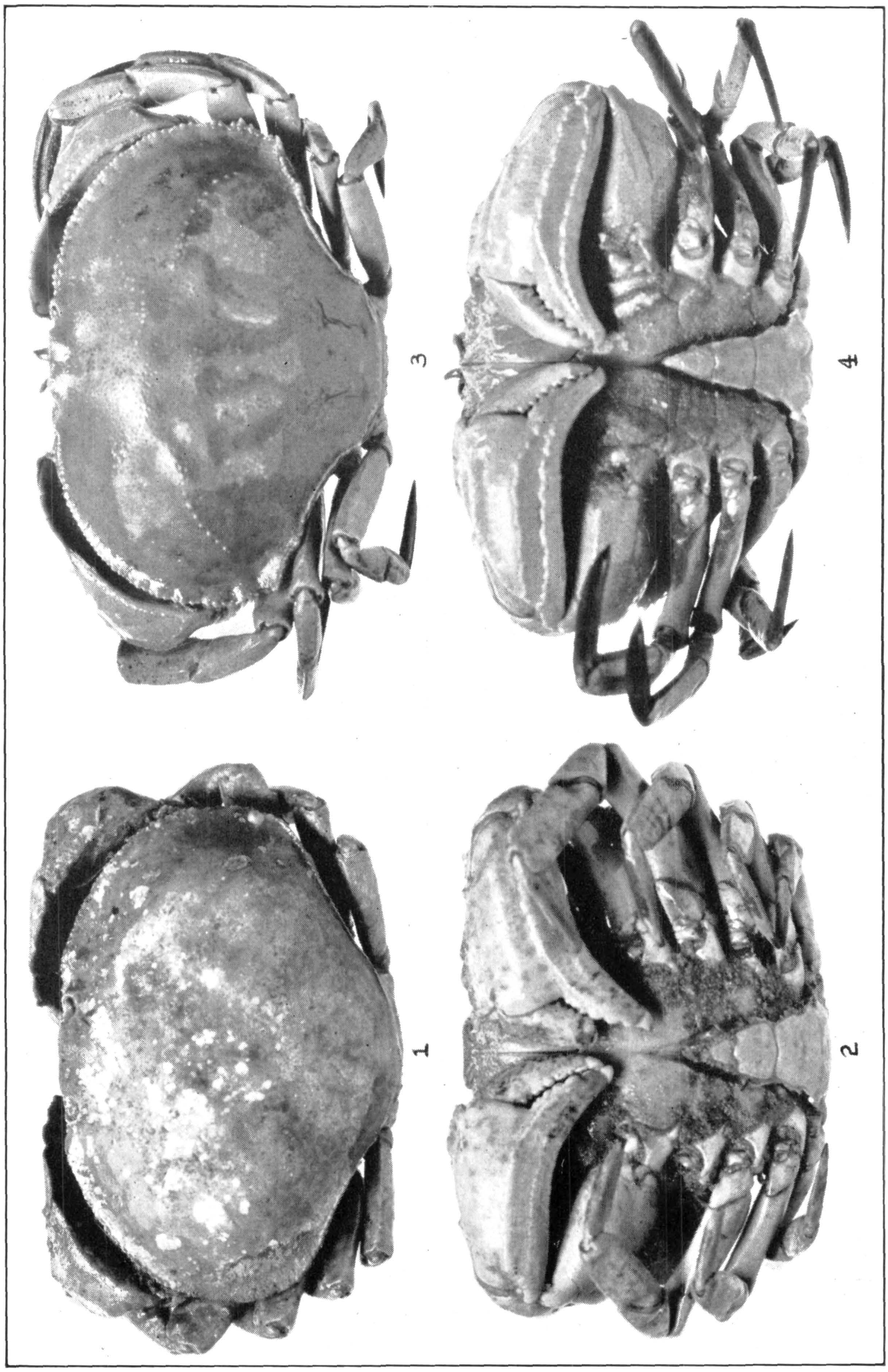
SPECIES OF HEPATUS.

1, *H. princeps*, male (61612), nine-tenths natural size, dorsal view; 2, same, ventral view; 3, *H. ephelificus*, female (66439), three-fifths natural size, dorsal view; 4, same, ventral view.



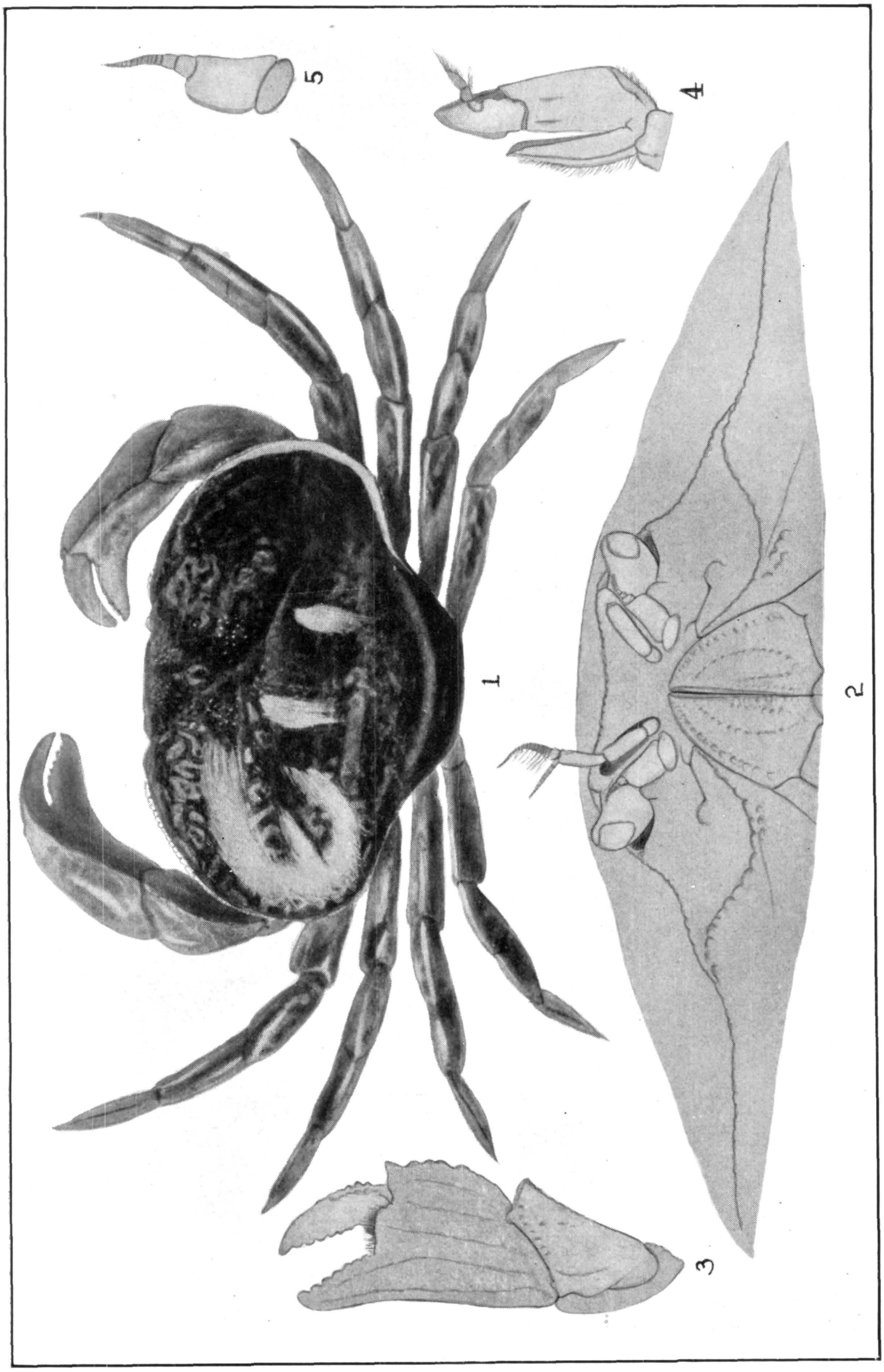
HEPATUS EPHELITICUS.

1, Dorsal view, reduced; 2, anterior portion, ventral view; 3, right chelipeds, outer face; 4, abdomen of female. (After Herklots.)



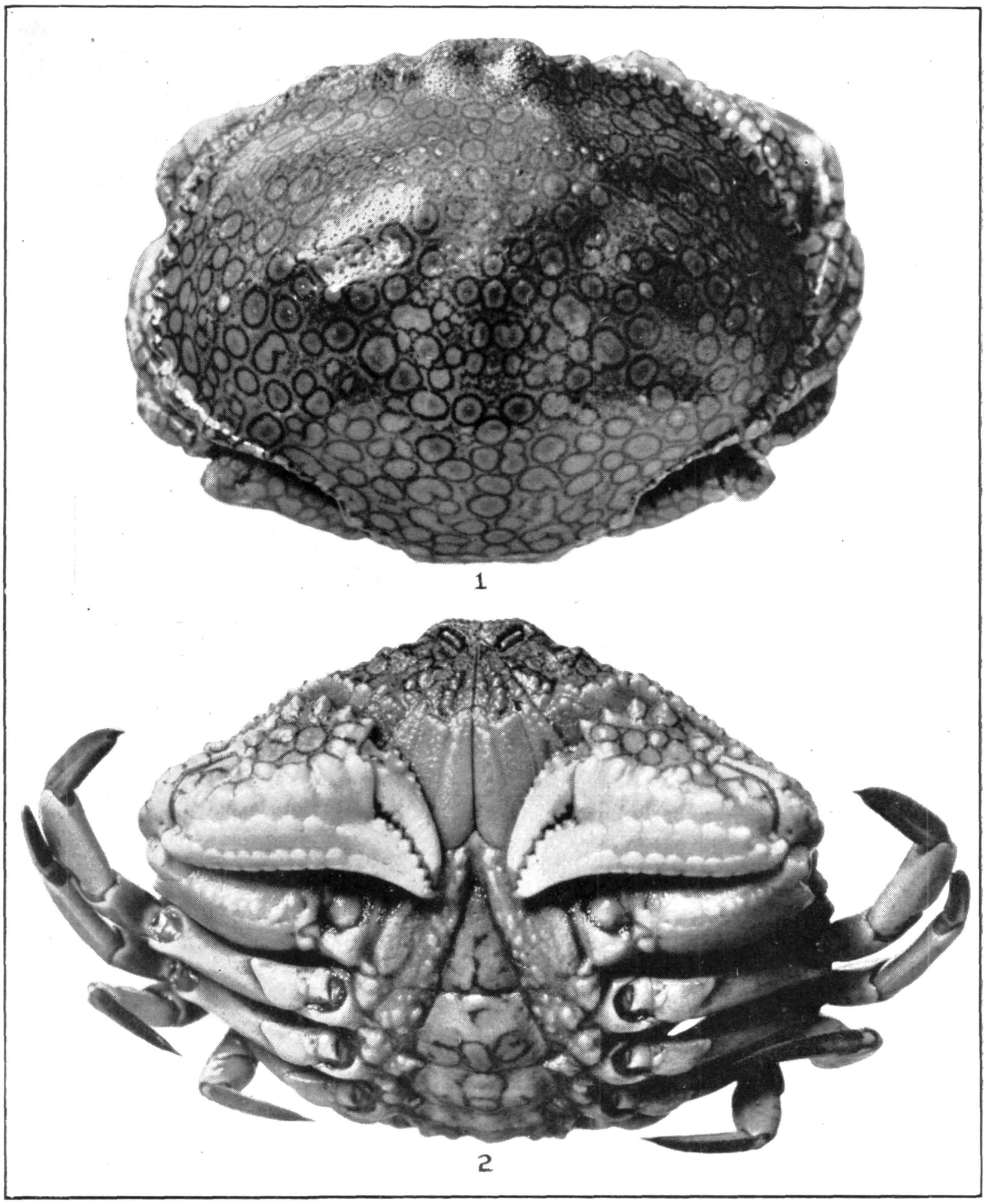
SPECIES OF HEPATUS.

1, *H. chiliensis*, male (66446), four-fifths natural size, dorsal view; 2, same, ventral view; 3, *H. kossmanni*, male (40712), four-fifths natural size, dorsal view; 4, same, ventral view.



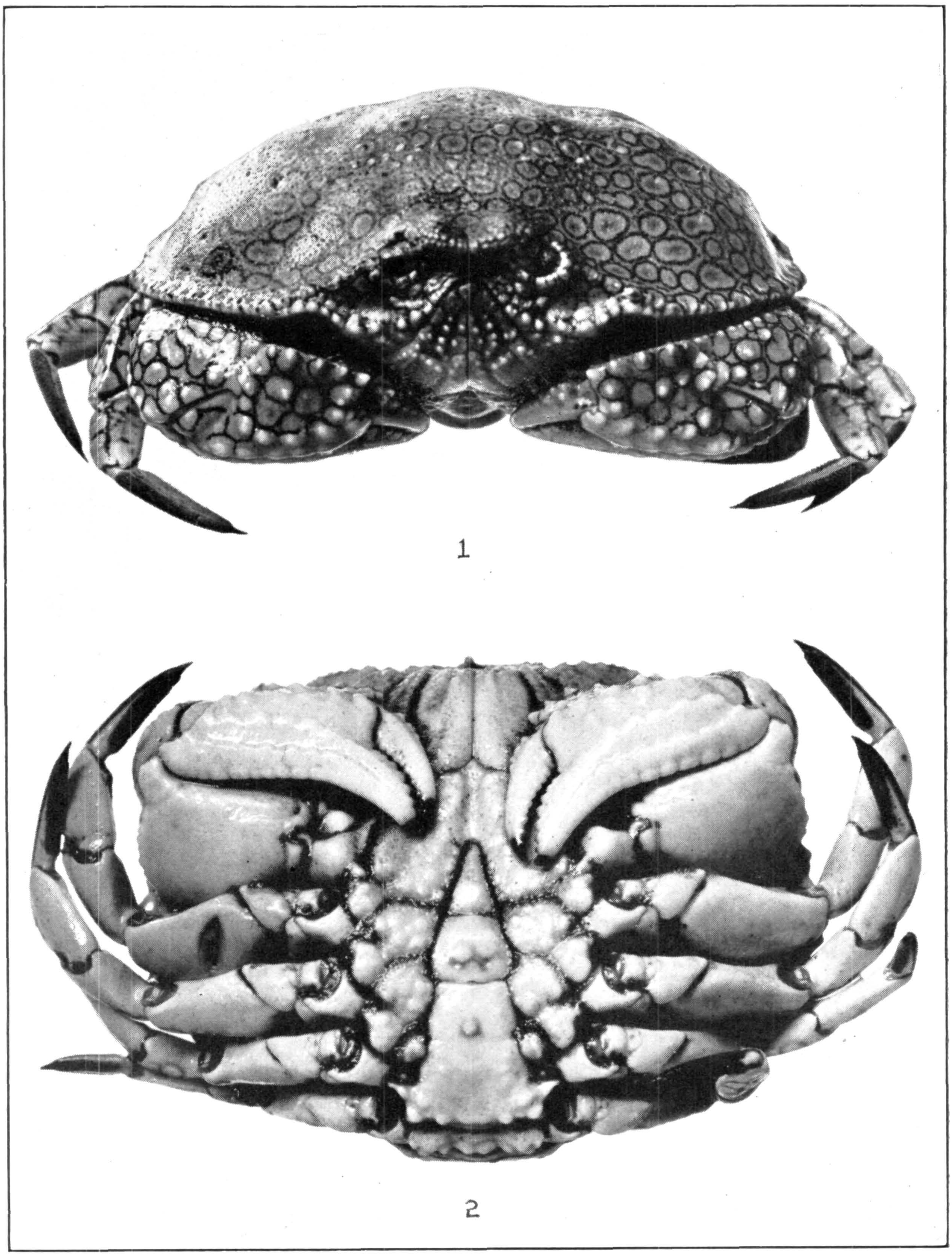
HEPATUS CHILIENSIS.

1, Dorsal view, about natural size; 2, ventral view of antennal region; 3, outer face of chela and carpus; 4, inner face of outer maxilliped; 5, outer antenna. (After d'Orbigny.)



HEPATUS LINEATUS.

1, Female, San Felipe (Glassell collection), × 1⅗, dorsal view; 2, same, ventral view

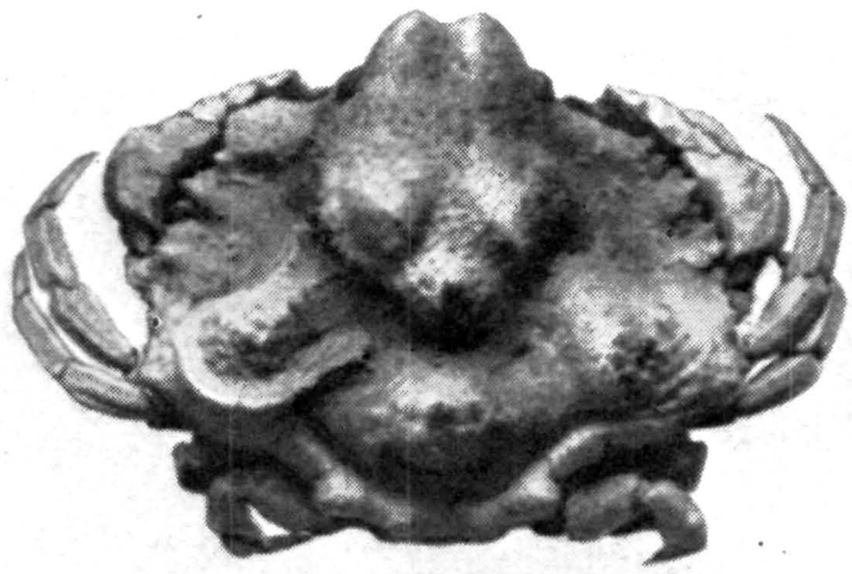


HEPATUS LINEATUS.

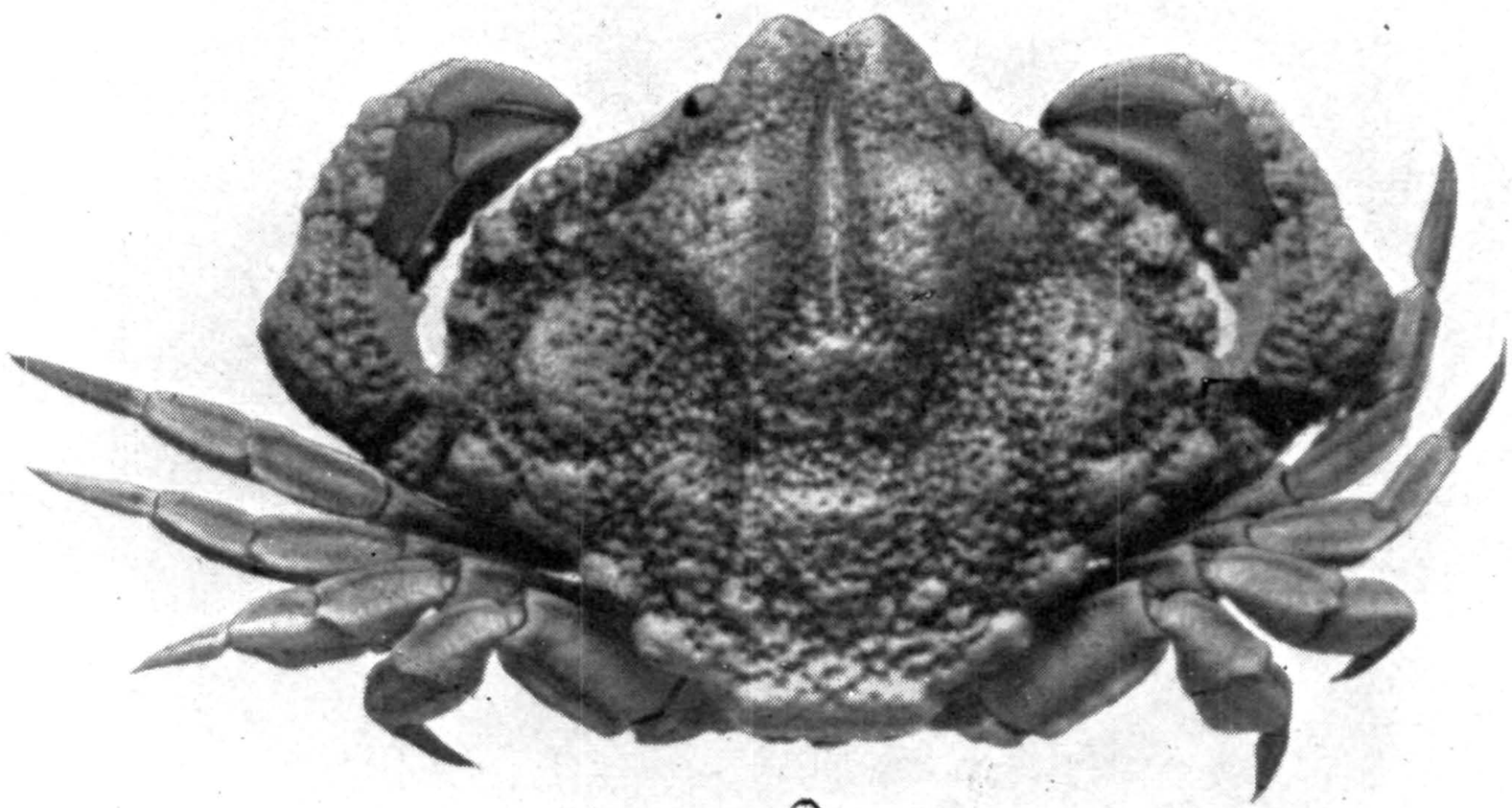
1, Female, San Felipe (Glassell collection), × 1⅗, front view; 2, male (67730), × 1⅗, ventral view.

SPECIES OF HEPATELLA.

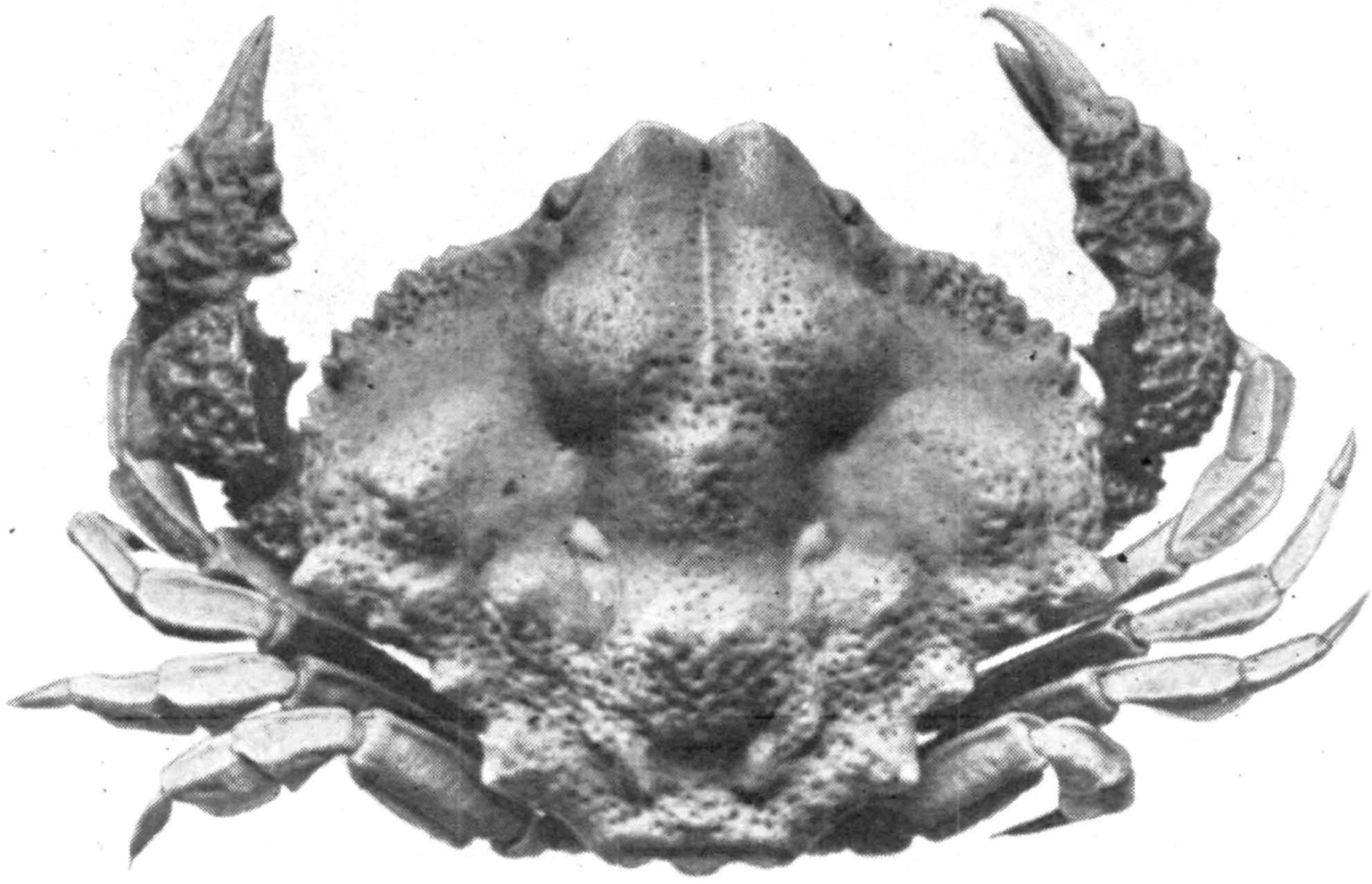
1, *H. amica*, male (59343), × 1⅓, dorsal view; 2, same, ventral view; 3, *H. peruviana*, ovigerous female holotype (40451), × 2, dorsal view; 4, same, ventral view.



1



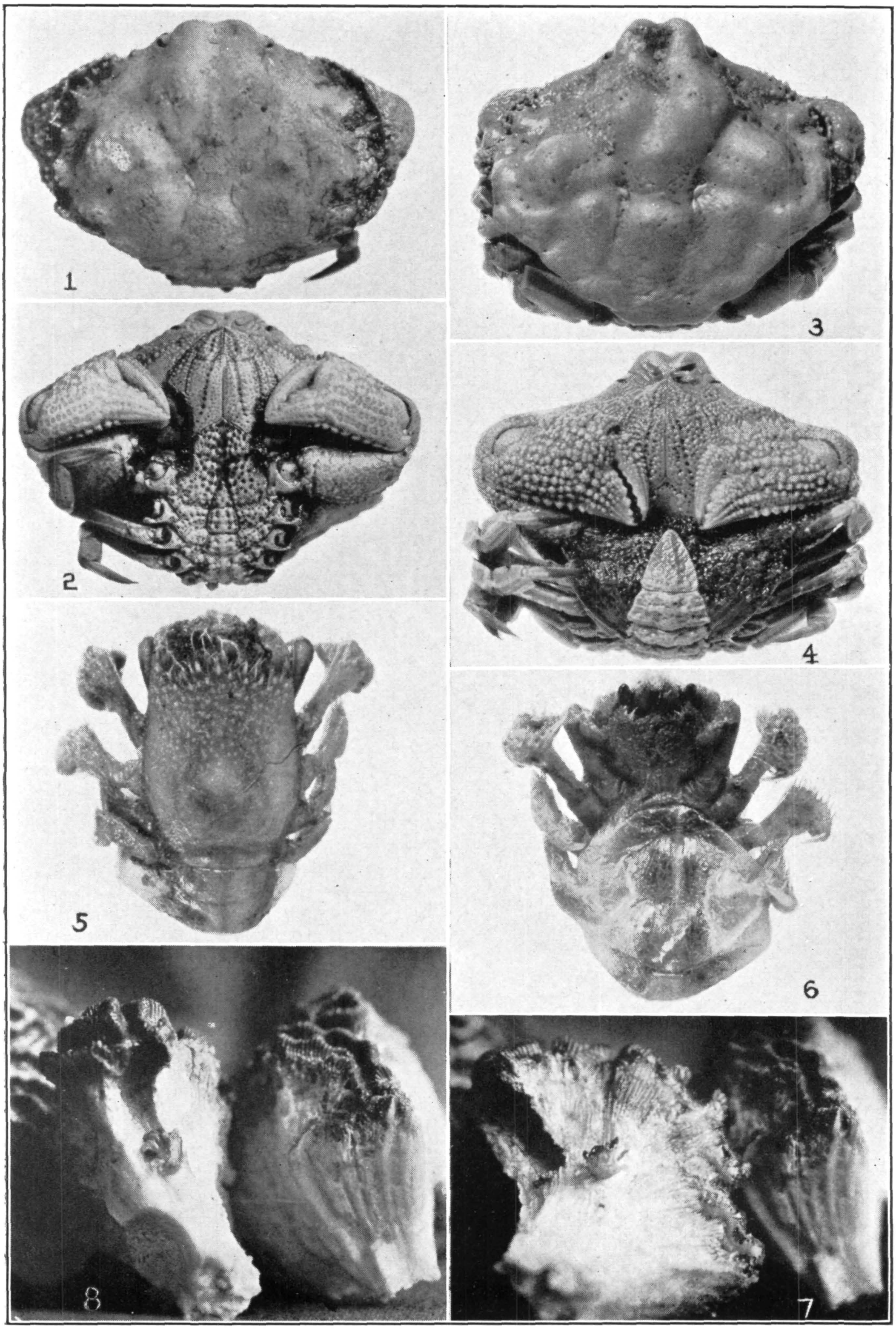
2



3

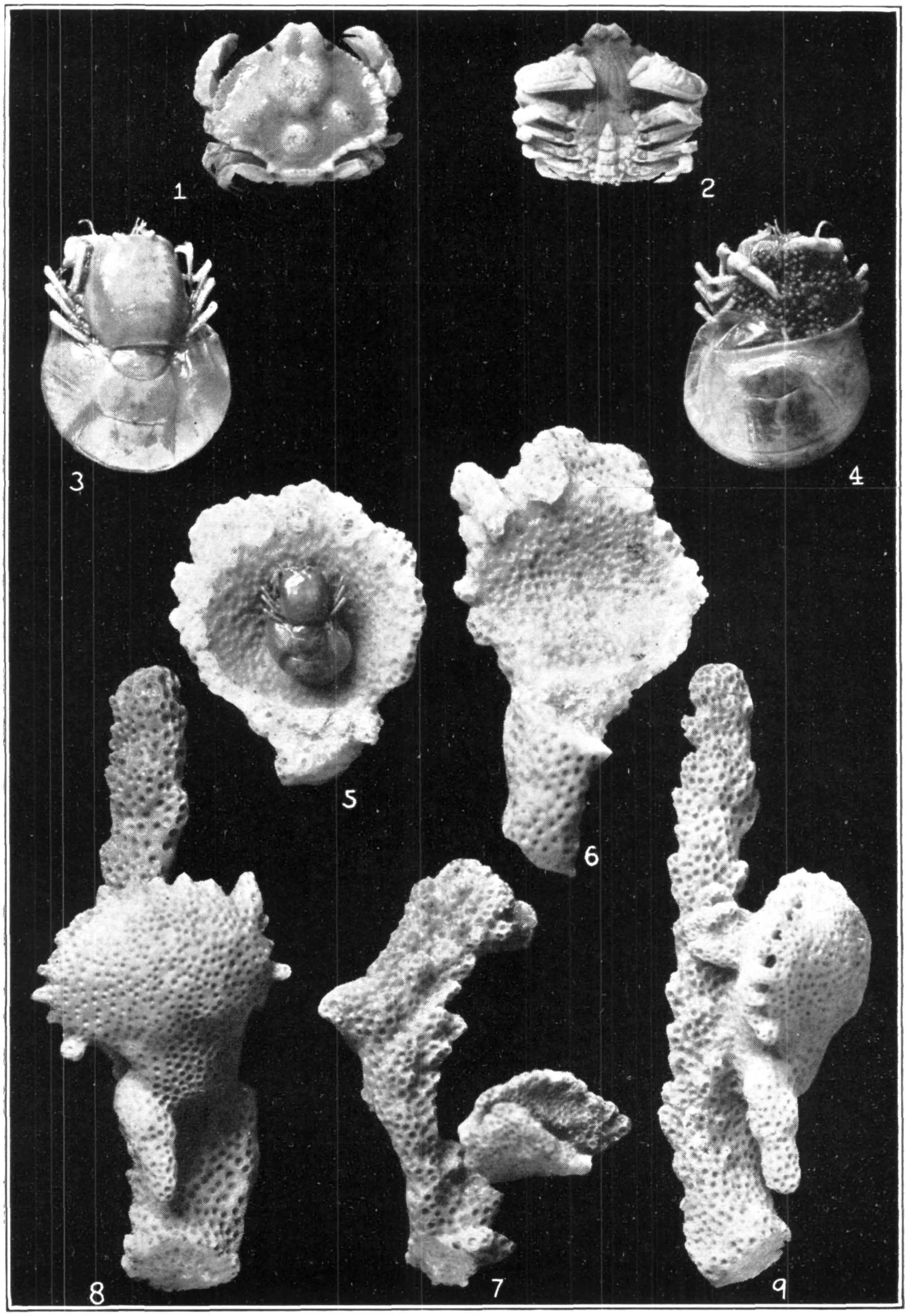
SPECIES OF OSACHILA.

1, *O. semilevis*, female holotype (17851), × 2½, dorsal view; 2, *O. antillensis*, female holotype (9503), × 2, dorsal view; 3, *O. tuberosa*, female (8746), × 2½, dorsal view.



SPECIES OF OSACHILA AND CRYPTOCHIRUS.

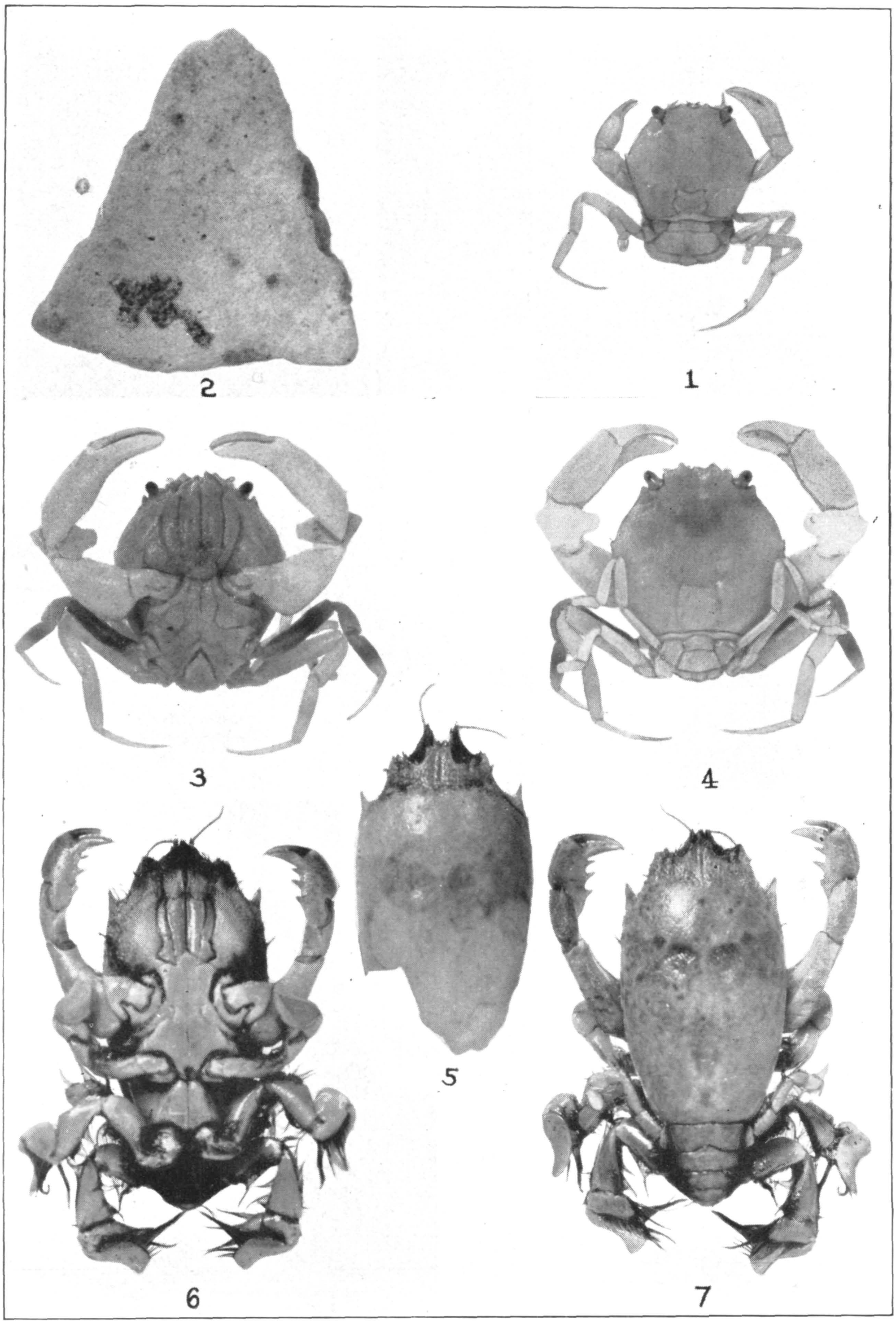
1, *Osachila lata*, male, Mexico (Calif. Acad. Sci.), × 2, dorsal view; 2, same, ventral view; 3, *O. levis*, ovigerous female holotype (21598), × 2, dorsal view; 4, same, ventral view; 5, *Cryptochirus corallicola*, female (61517), × 3, dorsal view; 6, same, ventral view; 7, 8, *C. corallicola*, Tortugas, and its burrow in *Maeandra areolata*.



OSACHILA ACUTA AND HAPALOCARCINUS MARSUPIALIS.

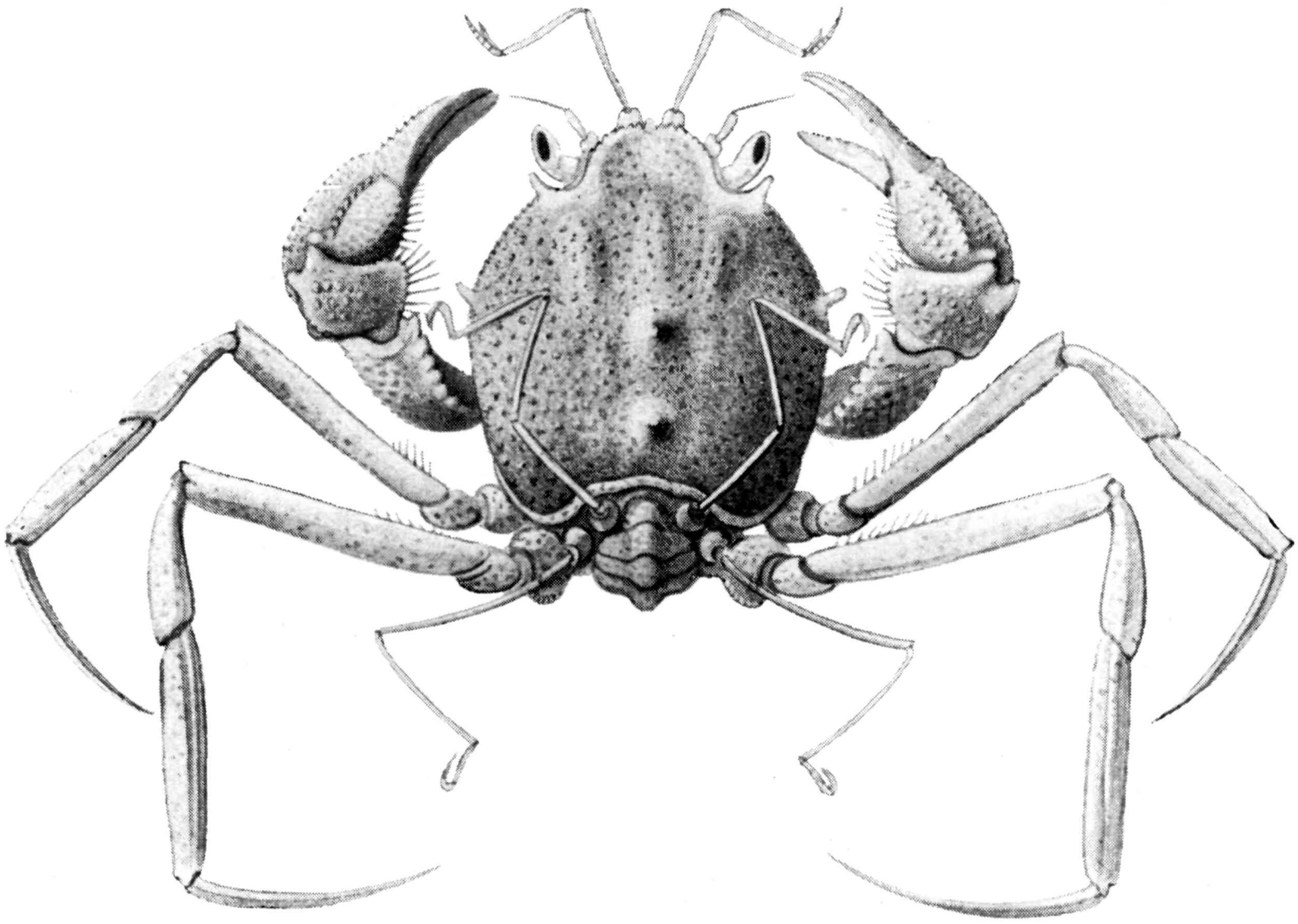
1, 2, *Osachila acuta:* 1, Male (69619), × 2¼, dorsal view; 2, same, ventral view, × 2¼.

3–9, *Hapalocarcinus marsupialis:* 3, Female (69177), × 3, dorsal view; 4, same, ventral view, × 3; 5, same specimen in half of a *Pocillopora* gall, × 1½; 6, the other half of the same gall, × 1½; 7, a young gall in the making, × 1½; 8, a full-sized gall, × 1½; 9, side view of same gall showing breathing holes, × 1½.

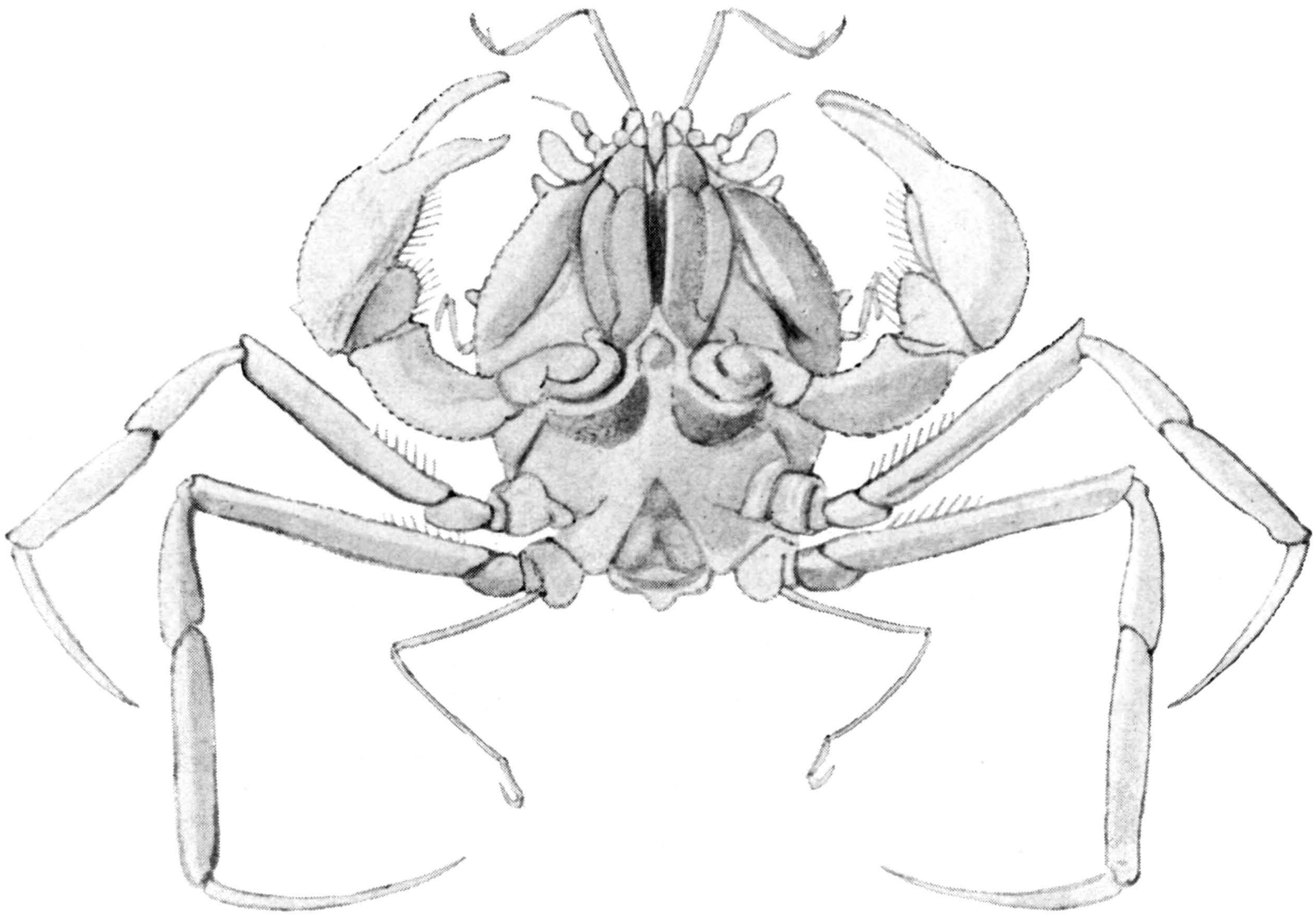


SPECIES OF CLYTHROCERUS AND RANINOIDES.

1, *Clythrocerus laminatus*, female (69222), × 4½, dorsal view; 2, piece of shell, normally carried by this species for protection; 3, *C. laminatus*, male holotype (69221), × 4½, ventral view; 4, same, dorsal view; 5, *Raninoides ecuadorensis*, carapace (69320), × 1⅘, dorsal view; 6, same species, male holotype (69319), × 1⅘, ventral view; 7, same, dorsal view.



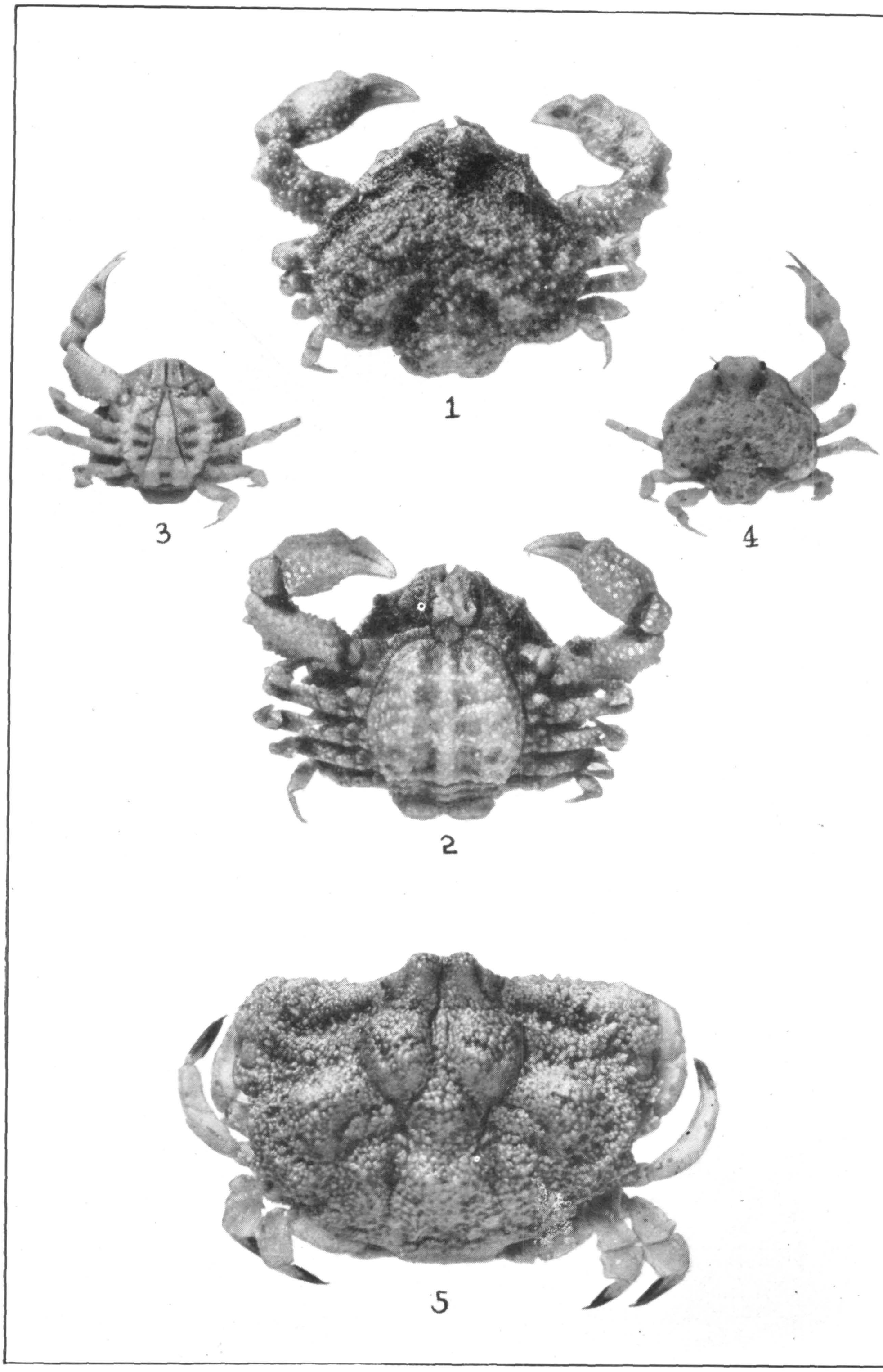
1



2

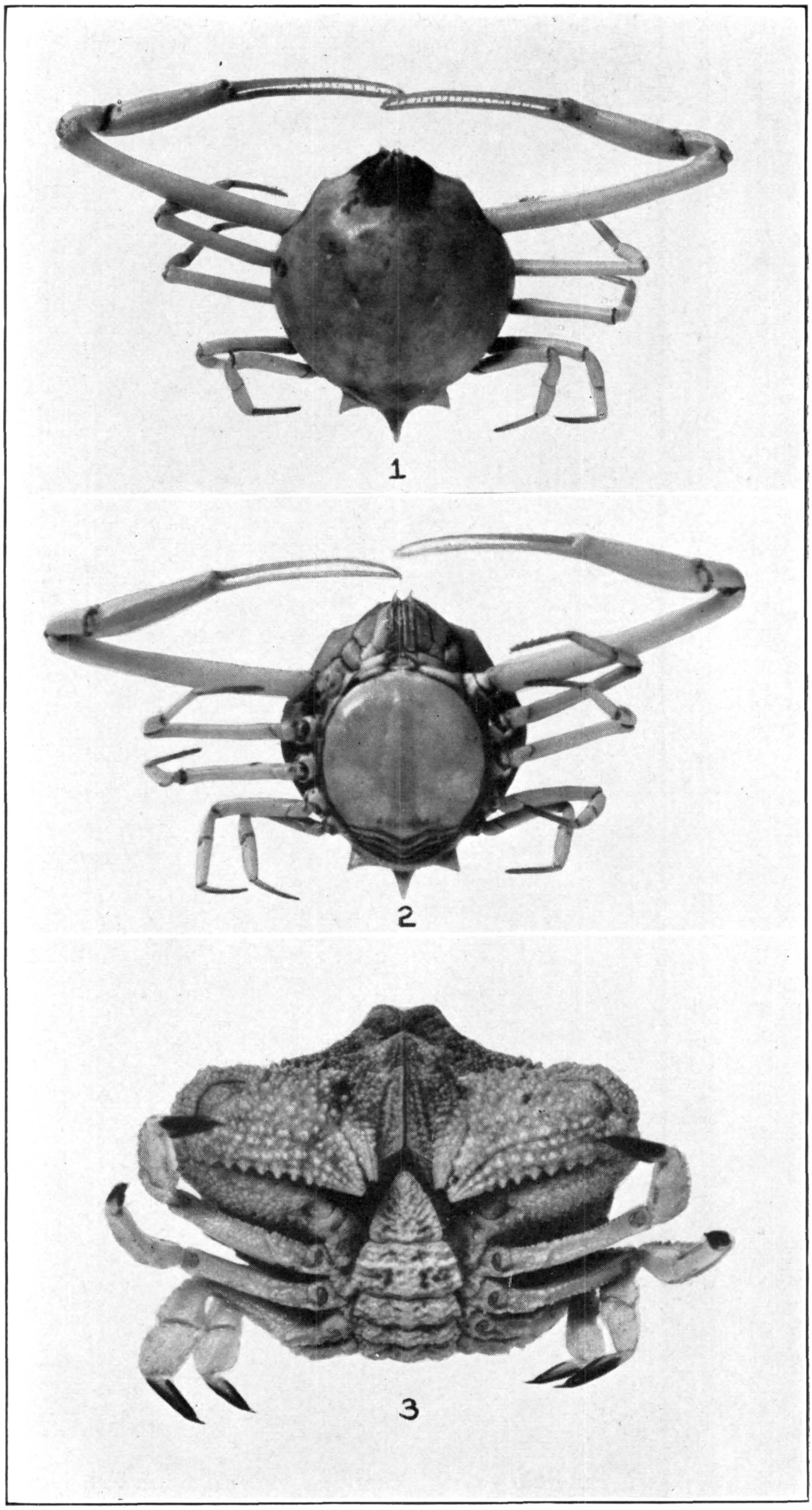
CYCLODORIPPE BOUVIERI.

1, Male holotype (67990), 5.2 mm long, dorsal view; 2, same, ventral view.



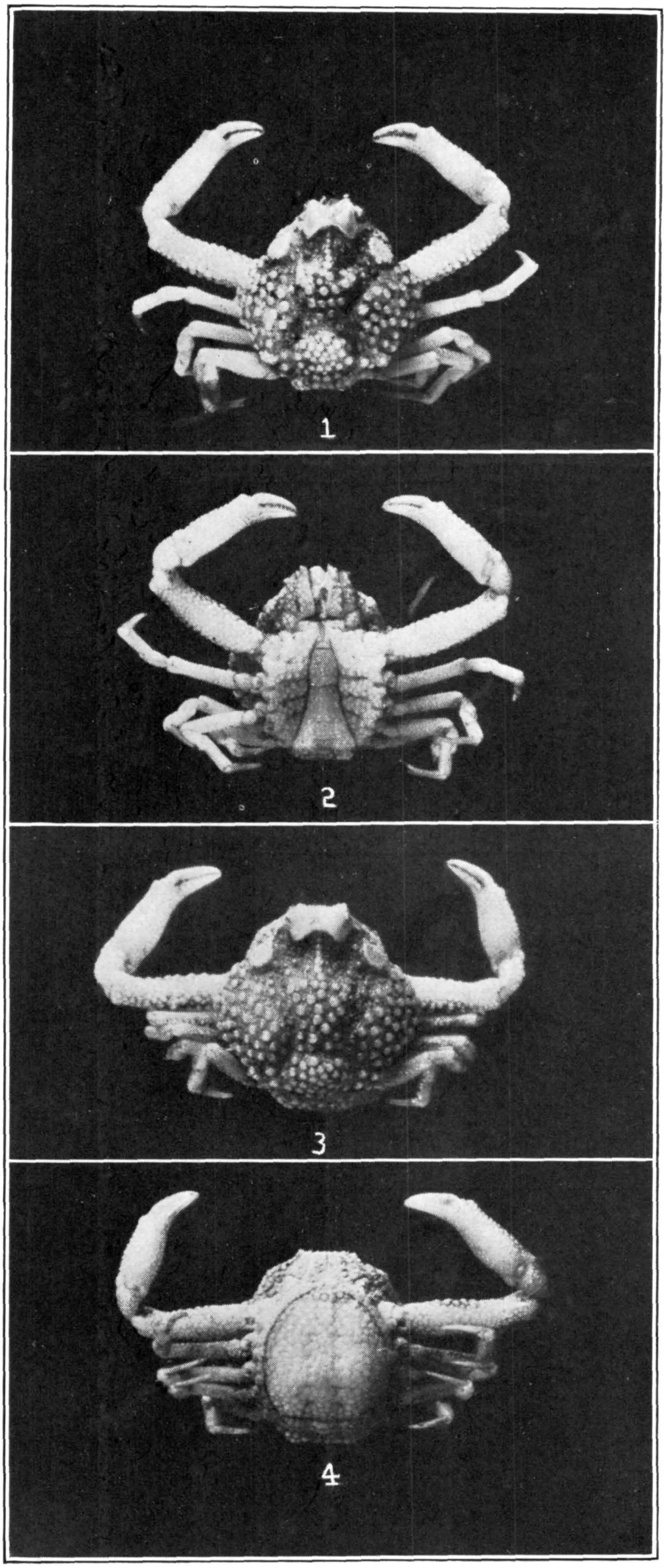
SPECIES OF EBALIA AND OSACHILA.

1, *Ebalia hancocki*, female (69273), × 3, dorsal view; 2, same, ventral view; 3, *E. clarionensis*, male holotype (69343), × 3, ventral view; 4, same, dorsal view; 5, *Osachila galapagensis*, female holotype (69215), × 2, dorsal view.



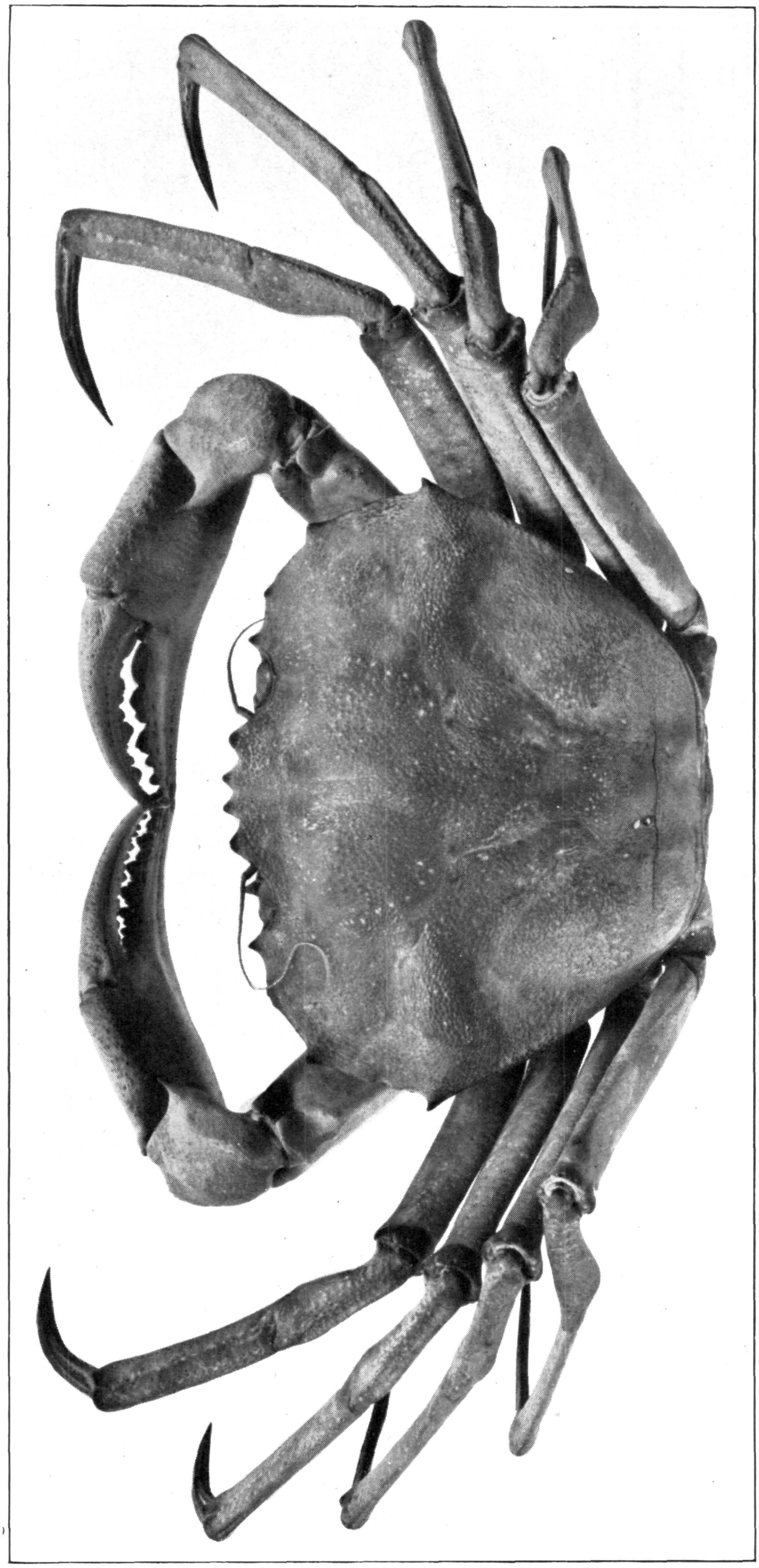
ILIACANTHA SCHMITTI AND OSACHILA GALAPAGENSIS.

1, *Iliacantha schmitti*, female holotype (69259), dorsal view; 2, same, ventral view; 3, *Osachila galapagensis*, female holotype (69215), × 2, ventral view.

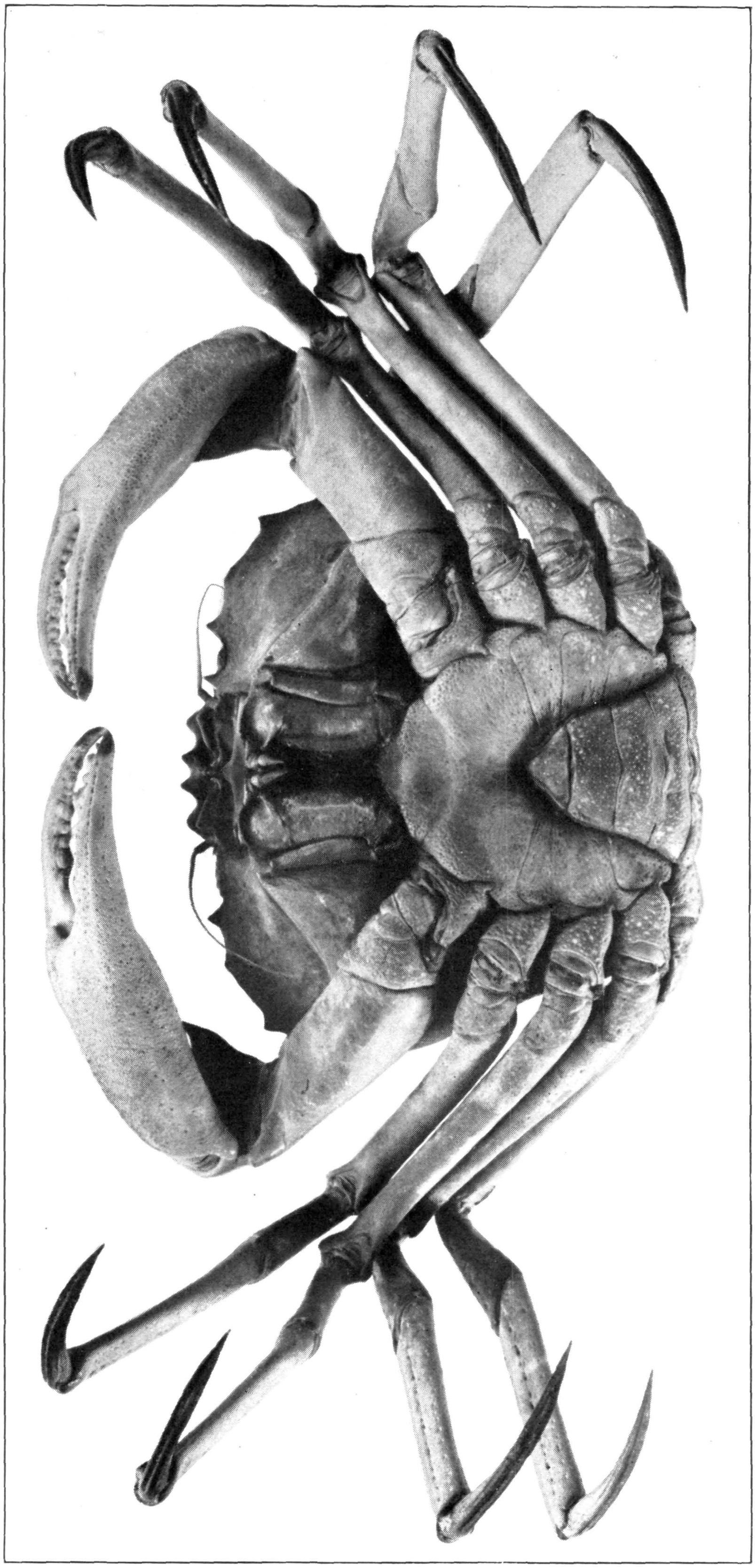


RANDALLIA MINUTA.

1, Male holotype (69745), × 5, dorsal view; 2, same, ventral view; 3, female, × 2, dorsal view; 4, same, ventral view



GERYON QUINQUEDENS.
Male (14376), 154 mm wide, dorsal view.



GERYON QUINQUEDENS.

Same specimen as plate 85, ventral view.