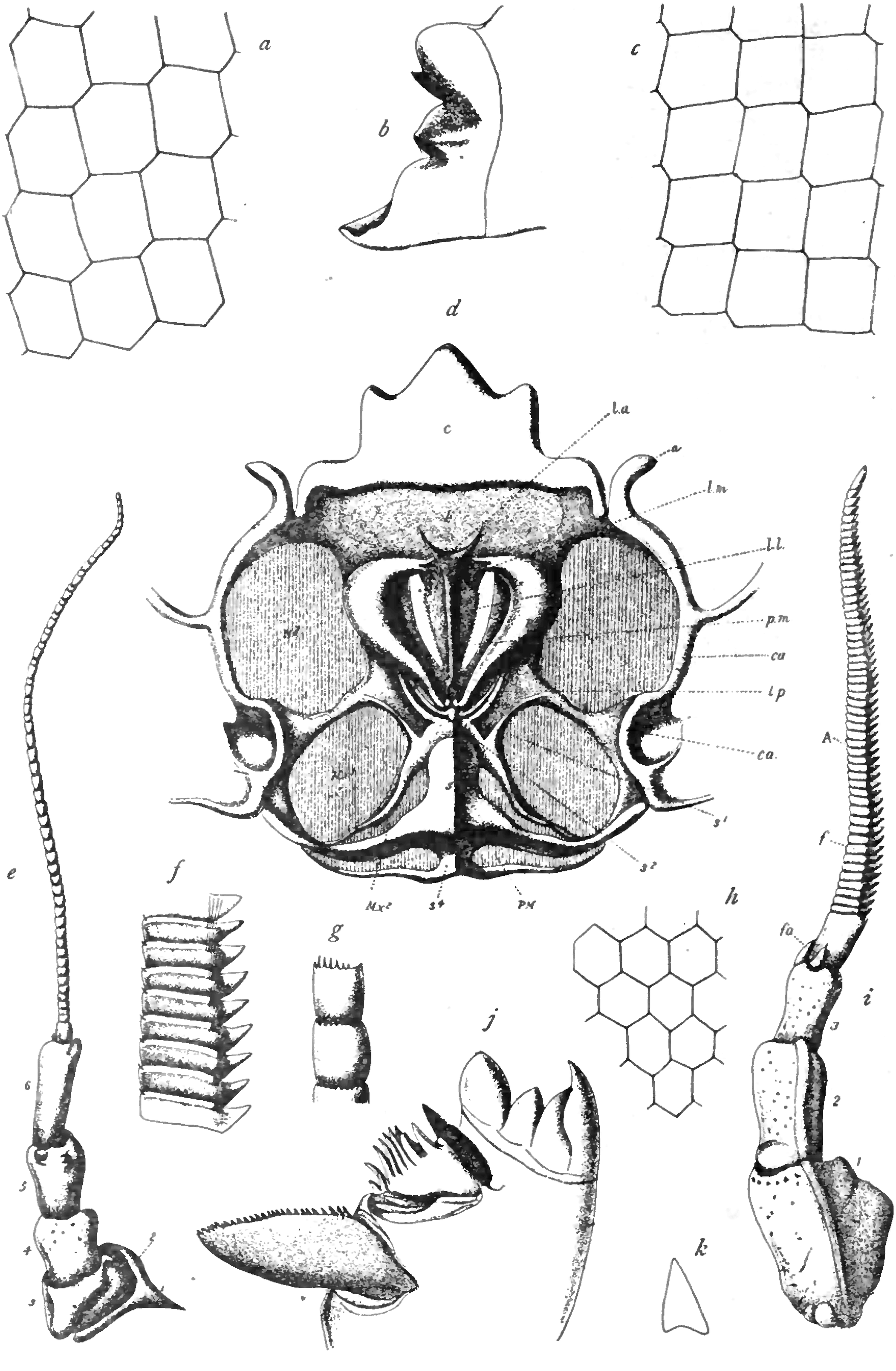

FIG. 116.—BATHYNOMUS GIGANTEUS (AFTER EDWARDS AND BOUVIER). *a*, CORNEULES IN THE EXTERNAL LAYER OF THE CORNEA. *b*, CUTTING PART OF MANDIBLE (INFERIOR EXTERNAL SIDE). *c*, CORNEULES IN THE INNER LAYER OF THE CORNEA. *d*, BUCCAL CAVITY. *e*, INFERIOR SIDE OF SECOND ANTENNA. *f*, SEVERAL ARTICLES OF THE FLAGELLUM OF THE FIRST ANTENNA. *g*, SEVERAL ARTICLES OF THE FLAGELLUM OF THE SECOND ANTENNA. *h*, CORNEULES OF CIROLANA ELONGATA. *i*, FIRST ANTENNA OF LEFT SIDE (INFERIOR FACE). *j*, LEFT MANDIBLE, INFERO-INTERNAL FACE OF THE ANTERIOR PART. *k*, LEFT EYE.

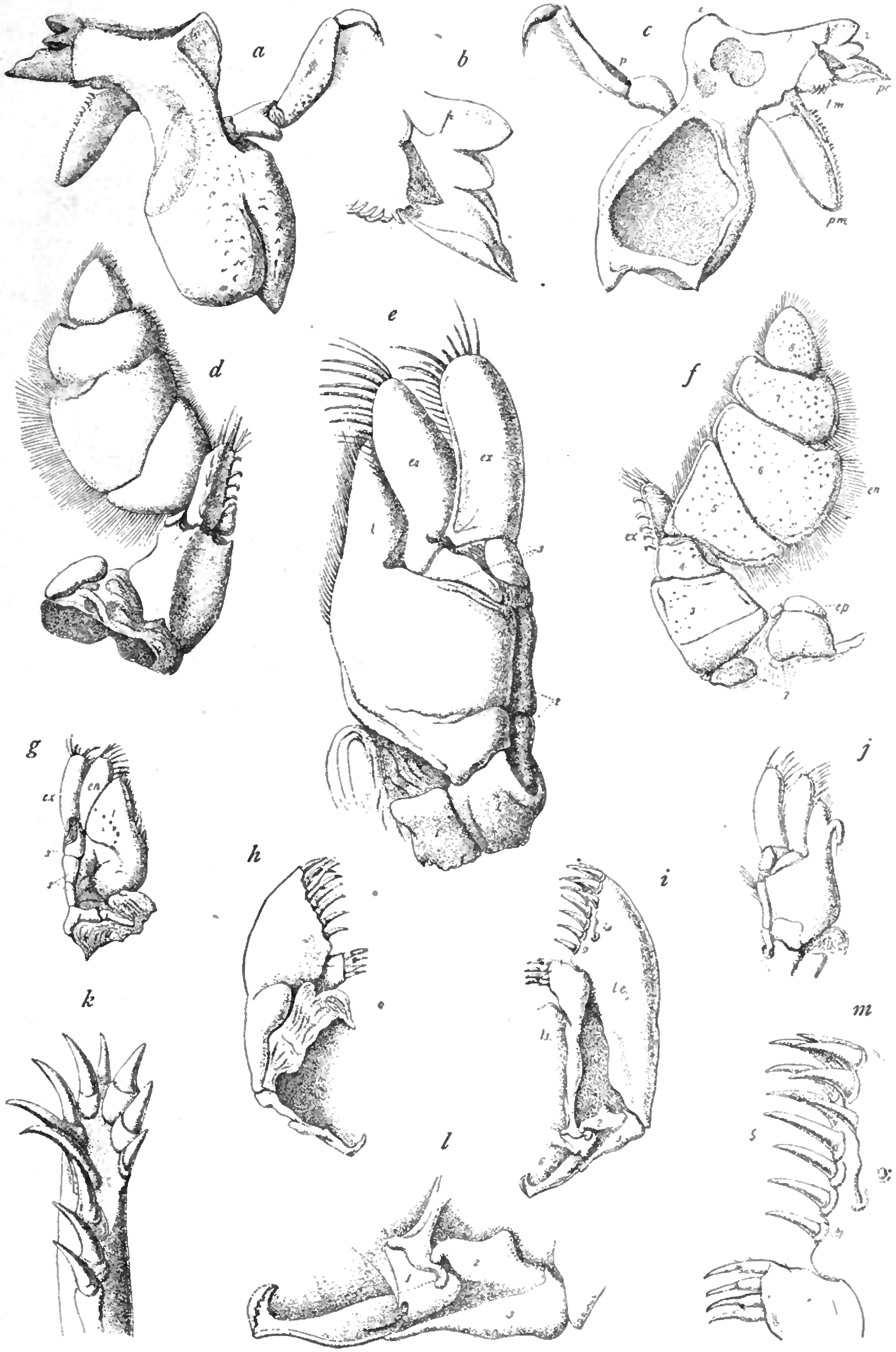

FIG. 117.—BATHYNOMUS GIGANTEUS (AFTER EDWARDS AND BOUVIER). *a*, LEFT MANDIBLE. *b*, CUTTING PART OF MANDIBLE (DORSAL SIDE). *c*, LEFT MANDIBLE (DORSAL SIDE). *d*, LEFT MAXILLIPED (VENTRAL SIDE). *e*, SECOND LEFT MAXILLA (VENTRAL SIDE). *f*, LEFT MAXILLIPED (DORSAL SIDE). *g*, SECOND LEFT MAXILLA (DORSAL SIDE). *h*, FIRST MAXILLA (DORSAL SIDE). *i*, THE SAME (VENTRAL SIDE). *j*, RIGHT SECOND MAXILLA (VENTRAL SIDE). *k*, TIP OF EXTERNAL LACINIA OF FIRST MAXILLA. *l*, BASAL PART OF FIRST MAXILLA. *m*, TIP OF MAXILLARY LACINIÆ OF FIRST MAXILLA.

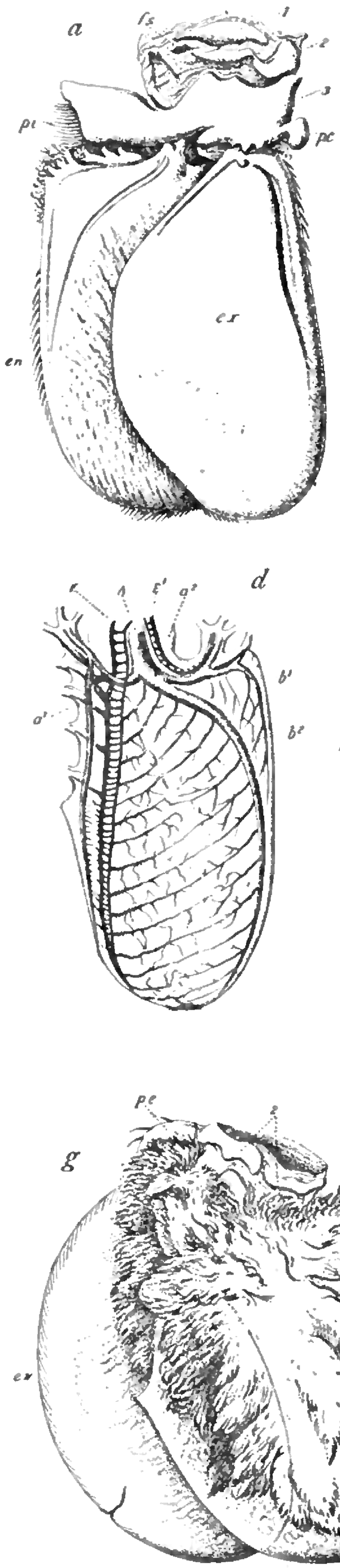

FIG. 118.—BATHYNOMUS GIGANTEUS (AFTER EDWARDS AND BOUVIER). *a*, LEFT ANTERIOR PLEOPOD (VENTRAL SIDE). *b*, EXTREMITY OF BRANCHIAL TUFT. *c*, LEFT ANTERIOR PLEOPOD (DORSAL SIDE). *d*, CIRCULATION IN RESPIRATORY ENDOPODITE. *e*, LEFT UROPOD (INFERIOR SIDE). *f*, LEFT PLEOPOD OF THIRD PAIR WITH THE TRUNKS OF THE ORIGIN OF THE BRANCHIAL TUFTS. *g*, POSTERIOR LEFT PLEOPOD (ANTERIOR SIDE). *h*, THE SAME (POSTERIOR SIDE).

COLOPISTHUS PARVUS Richardson.

Colopisthus parvus RICHARDSON, Trans. Conn. Acad. Sciences, XI, 1902, pp. 289–290, pl. XXXVIII, figs. 33–36.

Localities.—Found in low water in the corallines at Bailey Bay, Bermudas, and at Waterloo, Castle Harbor, Bermudas.

Head transversely elliptical, the anterior and posterior margins rounded. The eyes are situated in the middle of the lateral margins at the extreme edge, and are elevated above the surface of the head like knobs. The head is concave between the eyes.

The first pair of antennæ are short, not much longer than the width of the head, and reach the end of the last peduncular joint of the second pair of antennæ. The flagellum is composed of three articles.

The second pair of antennæ are also short, extending to the posterior margin of the first thoracic segment; flagellum is composed of seven articles.

The first thoracic segment is longest. The others are subequal with well-defined epimera.

The first five abdominal segments are all coalesced into one segment. The terminal segment is triangular and strongly keeled along the median longitudinal line.

The inner branches of the uropoda extend beyond the tip of the terminal segment, are broadly oval and fringed with hairs. The outer branches are narrowly oval, about half as wide as the inner branches, and shorter.

Color light yellow, with numerous black dots.

About seven specimens were collected by Prof. A. E. Verrill and party at Bailey Bay, Bermudas, in 1898. Found at low water in corallines. Others were collected in 1901 at Waterloo, on Castle Harbor, Bermudas.

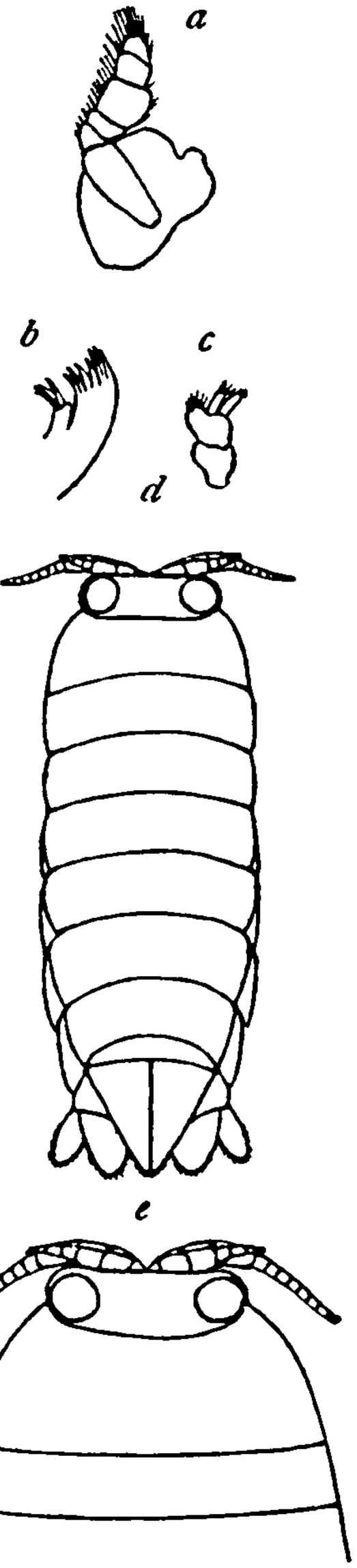

FIG. 119.—COLOPISTHUS PARVUS. *a*, MAXILLIPED. *b*, SECOND MAXILLA. *c*, FIRST MAXILLA. *d*, GENERAL FIGURE. *e*, HEAD AND FIRST TWO THORACIC SEGMENTS.

Type specimen from the Bermudas in Peabody Museum, Yale University. Cat. No. 3179.

Family VI. EXOCORALLANIDÆ.[a]

Clypeus wide and very short, subtriangular, seen from below concealed by the mandibles. Labrum wide and very short, subhorizontal or vertical, seen from below very often concealed by the mandibles. Apical tooth of mandibles of great length; movable lacinia and molar part wanting.

The first maxillæ are robust; the lacinia of the first article is inflated at the apex and unarmed; third article very robust, from the middle to the apex becoming very much narrower and curved somewhat outward, the apex furnished with a single very long and very robust spine curved somewhat inward. Second maxillæ short, narrow, feeble, the apex with two free almost rudimentary laciniæ. Maxillipeds narrow, free; palp with the antepenultimate article elongated, more than twice as long as wide.

26. Genus EXOCORALLANA Stebbing.[b]

ANALYTICAL KEY TO THE SPECIES OF THE GENUS EXOCORALLANA.[c]

a. Eyes moderate or large, some distance apart in the middle at the upper end.
  b. Left mandible, seen in position, with the apical part profoundly trifid. Clypeus and labrum very conspicuous.
    c. Basal article of the first pair of antennæ narrow, without spine. Head of male ornamented with two or more horn-like tubercles. First segment of body not ornamented with tubercles.
      d. Head of male ornamented with three tubercles, two on the dorsal surface and one being the produced median point. Thorax not tuberculated.
Exocorallana tricornis (Hansen)
      d′. Head of male ornamented with two dorsal tubercles. Median point not produced in tubercles. Thorax tuberculated.
Exocorallana mexicana, new species.
    c′. Basal article of the first pair of antennæ dilated, ornamented with spine at inner exposed angle. Head of male ornamented with four horn-like tubercles. First segment of body ornamented with two tubercles.
Exocorallana sexticornis (Richardson)
  b′. Left mandible, seen in position, with the apical part obscurely trifid or forming a single apex. Labium and clypeus partly or very often entirely covered by the mandibles.
    c. Basal article of the peduncle of the antennulæ moderately narrow, seen from below not prominent above the basal joints of the antennæ. Last segment of the abdomen not ornamented with basal tubercles near the median line.
      d. Head of male ornamented with four tubercles.
Exocorallana quadricornis (Hansen)
      d′. Head of male not ornamented with tubercles.
Exocorallana truncata (Richardson)

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[a] See Hansen for characters of family, Vidensk. Selsk. Skr. (6), V, 1890, pp. 311–313, 317, 376.

[b] Fauna and Geography of the Maldive and Laccadive Archipelagoes, II, Pt. 3, 1904, p. 704.

[c] This key, with the exception of three species which are inserted, is taken entirely from Hansen, Vidensk. Selsk. Skr., 6th ser., natur. og. math., Afd. V, 1890, pp. 378, 379.

c'. Basal article of the peduncle of the antennulæ very much dilated, seen from below, so prominent that the basal joints of the antennæ are placed in a transverse cleft moderately deep between the antennulæ and the mandibles. Last segment of the body ornamented with two large basal tubercles situated near the median line.

d. Fourth and fifth segments of the abdomen a little impressed in the dorsal median line, not ornamented with carinæ or tubercles. Last segment of the abdomen with two spines at the apex.

Exocorallana subtilis (Hansen)

d'. Fourth and fifth segments of the abdomen with a deep longitudinal excavation in the dorsal median line, ornamented with many carinæ and tubercles. Last segment of the abdomen with four spines at the apex.

Exocorallana antillensis (Hansen)

a. Eyes very large, contiguous in the middle of the head.

b'. Last segment of the abdomen rather short, widely rounded posteriorly and with a median excavation deep and moderately wide.

Exocorallana fissicauda (Hansen)

b'. Last segment of the abdomen rather long, narrowly rounded posteriorly, with no excavation.

c. Fourth and fifth segments of the abdomen deeply excavate longitudinally in the dorsal median line and ornamented with carinæ. Last segment of the body with an incision in the middle of the side and ornamented on the dorsal surface with two densely setose areas and with two large basal tubercles situated near the median line ..... *Exocorallana oculata* (Hansen)

c'. Fourth and fifth segments of the body very little impressed in the dorsal median line, ornamented with no carinæ. Last segment of the abdomen entire at the sides, ornamented on the dorsal surface everywhere with very short hairs remotely scattered ..... *Exocorallana warmingii* (Hansen)

EXOCORALLANA TRICORNIS (Hansen).

Corallana tricornis Hansen, Vidensk. Selsk. Skr. (6), V, 1890, pp. 379–381, pl. vi, figs. 4–4 p; pl. vii, figs. 1–1 d.—Richardson, Proceedings U. S. Nat. Mus., XXIII, 1901, p. 518.—Moore, Bull. U. S. Fish Comm., XX, Pt. 2, 1902, p. 169, pl. ix, figs. 2–5.

Localities.—Cape Catoche, Yucatan; between Delta of the Mississippi and Cedar Keys, Florida; St. Thomas, West Indies; Hucares, Porto Rico; St. Croix, West Indies; Jamaica; Belize, British Honduras; Realejo, Nicaragua, Central America.

Depth.—24–27 fathoms.

Body narrow, elongate, three times longer than wide, 4 mm.; 12 mm.

Head wider than long, 1 mm.; 2 mm. with the antero-lateral margins rounded and produced in the middle in a prominent triangular process half a mm. in length, with broad base and apex emarginate or slightly bifid and directed upward, the whole process forming a right angle with the dorsal surface of the head. The eyes are large, conspicuous, and composite and occupy a large portion of the dorsal surface of the head; they are separated from each other by a median groove which extends from the base of the frontal process to the posterior margin of the head. On the posterior portion of the head are two large, prominent tubercles, one on either side of the median

groove. The first pair of antennæ have the first two articles almost confluent and scarcely distinguishable; the first is twice as long as the second; the third is also twice as long as the second. The flagellum is composed of eleven articles. The first pair of antennæ extend almost to the middle of the last article of the peduncle of the second pair of antennæ. The second pair of antennæ have the first two articles short, the second a little shorter than the first; the third is nearly twice as long as the second; the fourth and fifth are subequal and each twice as long as the third. The flagellum is composed of sixteen articles. The second antennæ extend to the posterior margin of the second thoracic segment. The maxilliped is composed of seven articles. The palp of the mandibles is composed of three articles. The frontal lamina is longer than wide, and has the anterior margin produced in a long, narrow acute median process.

The first segment of the thorax is slightly longer than any of the others, and has two small inconspicuous tubercles on the anterior por-

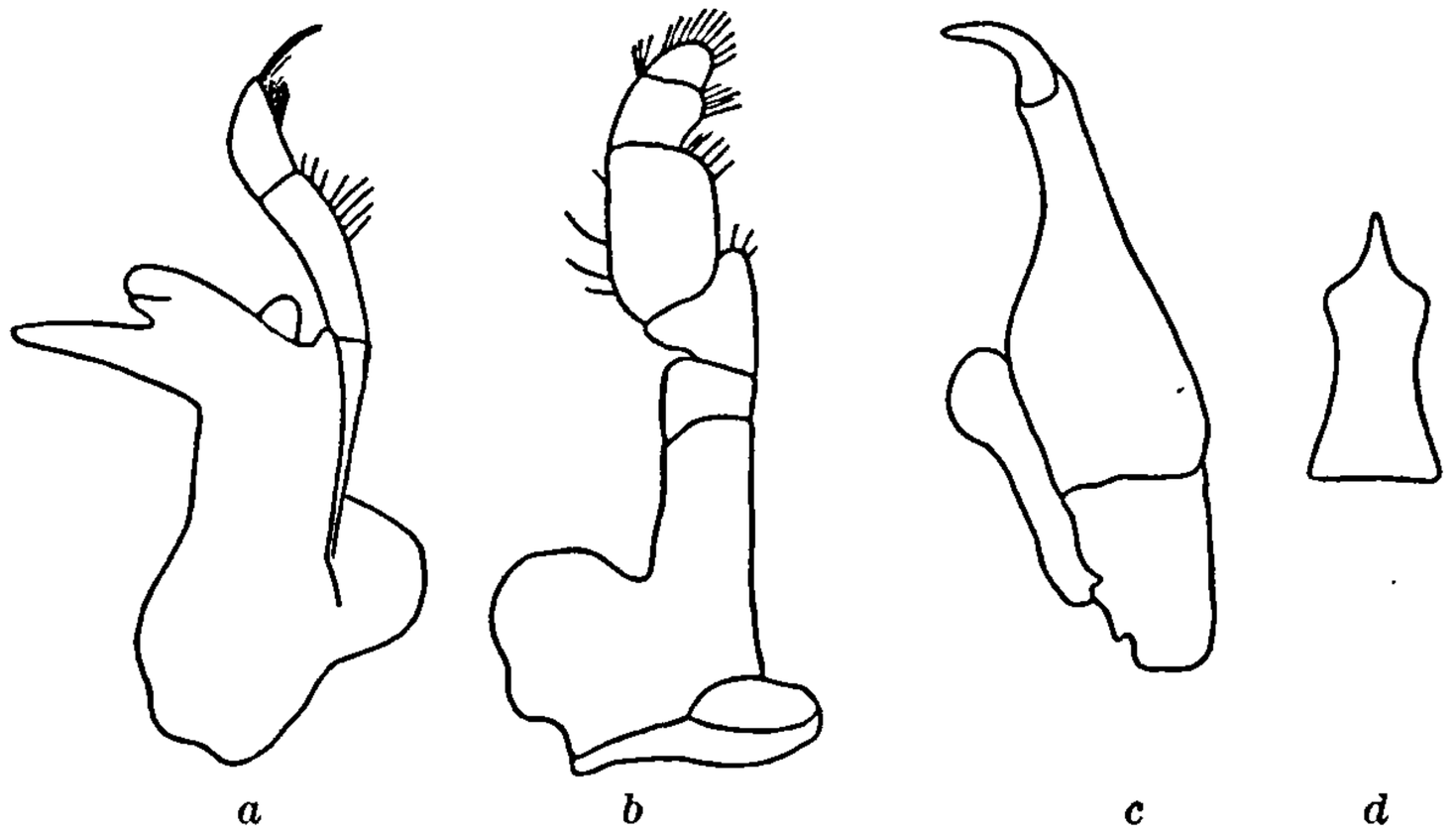


FIG. 120.—EXOCORALLANA TRICORNIS. *a*, MANDIBLE. × 51⅔. *b*, MAXILLIPED. × 51⅔. *c*, FIRST MAXILLA. × 51⅔. *d*, FRONTAL LAMINA. × 51⅔.

tion, one on either side of the median line. The epimera are distinct on all the segments with the exception of the first. They are all crossed obliquely by an arched carina. The outer post-lateral angles of the first two are rounded. In the last four the outer post-lateral angle is produced beyond the posterior margin of the segments.

All the segments of the abdomen are distinct. The second and third segments have the posterior margins tuberculate; the fourth segment has two transverse rows of tubercles; the fifth segment has three transverse rows of tubercles. In the fourth and fifth segments there is a narrow median depression, this area having only a single longitudinal row of tubercles right in the median line, two for each of the segments. The sixth or terminal segment is triangulate in shape with the apex rounded and furnished with short spines. At the base is a transverse row of tubercles on either side of a shallow median longitudinal groove or furrow. Below the row of tubercles and on either side of this median groove the lateral portions of the segment

are somewhat hirsute. A little more than half way between the base and the apex of the segment the lateral margin is incised on either side. The inner branch of the uropoda is broad and posteriorly truncate with the lateral angles rounded; it is as long as the terminal segment of the body. The outer branch is less than half as wide as the inner branch, is produced to a narrowly rounded extremity, and is as long as the outer branch. The inner angle of the peduncle extends a little beyond the lateral incisions of the terminal abdominal segment.

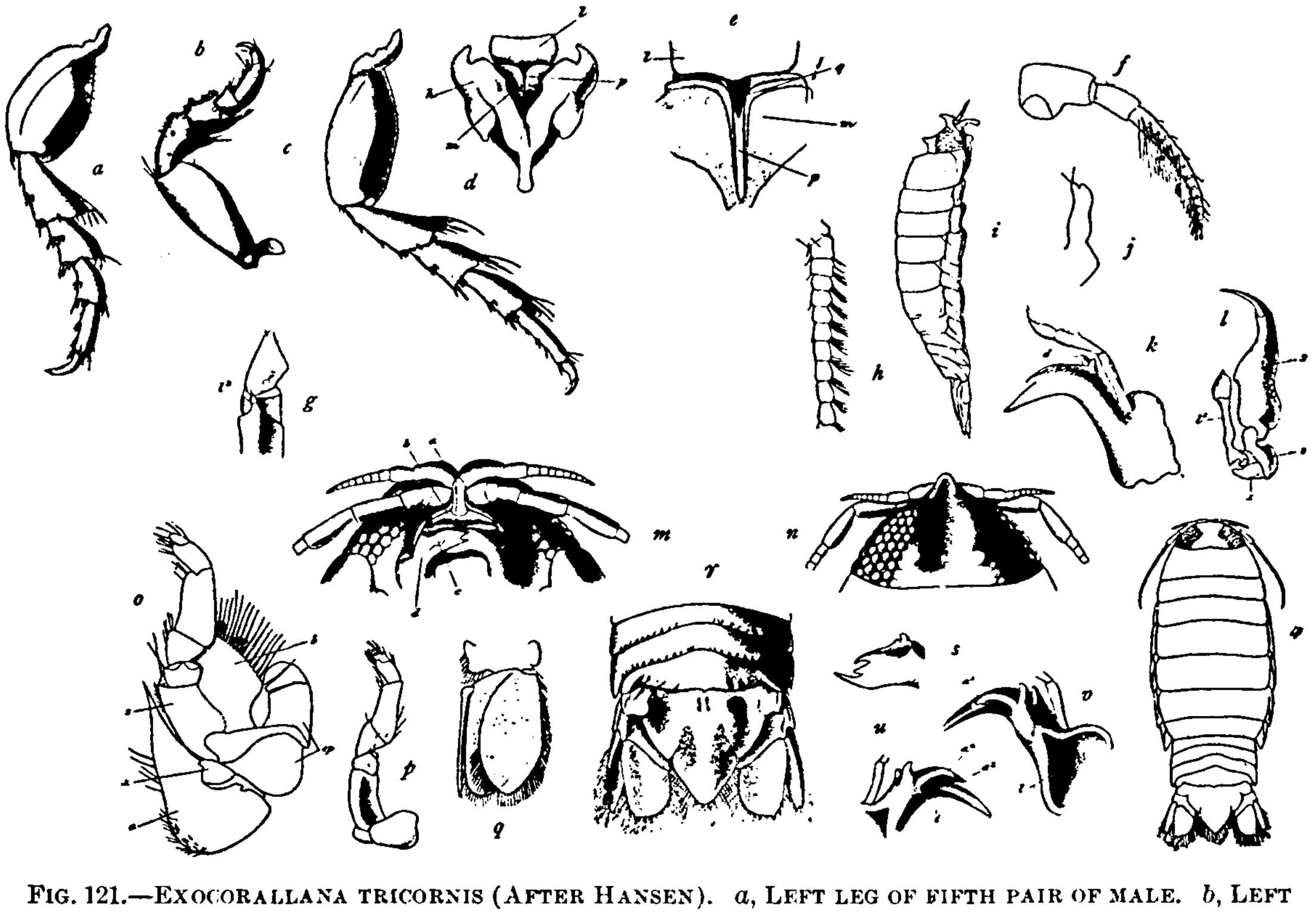


FIG. 121.—EXOCORALLANA TRICORNIS (AFTER HANSEN). *a*, LEFT LEG OF FIFTH PAIR OF MALE. *b*, LEFT LEG OF SECOND PAIR OF MALE. *c*, LEFT LEG OF SEVENTH PAIR OF MALE. *d*, INNER PARTS OF MOUTH, FROM BELOW. *e*, INNER PARTS OF MOUTH (PARAGNATHIA OMITTED). *f*, FIRST ANTENNA OF FEMALE. *g*, MIDDLE PART OF LEFT MAXILLIPED OF MALE. *h*, BASAL PART OF FLAGELLUM OF SECOND ANTENNA OF MALE. *i*, LATERAL VIEW OF MALE. *j*, LEFT MAXILLA OF SECOND PAIR OF MALE. *k*, LEFT MANDIBLE OF MALE. *l*, LEFT MAXILLA OF FIRST PAIR. *m*, VENTRAL VIEW OF HEAD OF FEMALE. *n*, HEAD OF ADULT MALE (DORSAL VIEW). *o*, LEFT MAXILLIPED OF FEMALE. *p*, LEFT MAXILLIPED OF MALE. *q*, LEFT PLEOPOD OF ADULT MALE (SECOND PAIR). *r*, POSTERIOR PART OF ABDOMEN OF ADULT MALE. *s*, DISTAL PART OF LEFT MANDIBLE. *t*, ADULT FEMALE. *u*, DISTAL PART OF LEFT MANDIBLE. *v*, RIGHT MANDIBLE. (ENLARGED.)

The first three pairs of legs are prehensile, the last four pairs ambulatory.

In the female the tubercles on the head are smaller and less prominent, as well as the median frontal process.

Three specimens, a male and two females are from the Gulf of California. They differ from the specimens of the East coast only in having larger tubercles on the abdominal segments on either side of the median longitudinal groove. This new subspecies may be known as *tricornis occidentalis*.

EXOCORALLANA MEXICANA, new species.

Body ovate, a little more than twice as long as wide, 3 mm., 7 mm.

Head wider than long, about twice as wide as long, 1 mm., 2 mm., with the anterior margin widely rounded and the posterior margin straight. Eyes large, composed of numerous ocelli, and separated in front by a distance equal to the length of one eye. Two small tubercles are situated about the middle of the head between the eyes, one on either side of the median line. The first pair of antennæ have the peduncle composed of only two articles, the first article being nearly twice as long as the second. The flagellum, which is composed of ten or eleven articles, extends to the posterior margin of the head or to the end of the fourth article of the peduncle of the second pair of antennæ. The second pair of antennæ have the first three articles of the peduncle short, the second one being the shortest; the fourth and fifth are long and subequal, each being about as long as the first three articles taken together. The flagellum is composed of about twenty-five articles, and extends to the middle of the fifth thoracic segment. The frontal lamina is narrow, elongate, and has the anterior end rounded. The clypeus is short and wide. The mandible is distinctly tridentate, the posterior tooth being the most elongate.

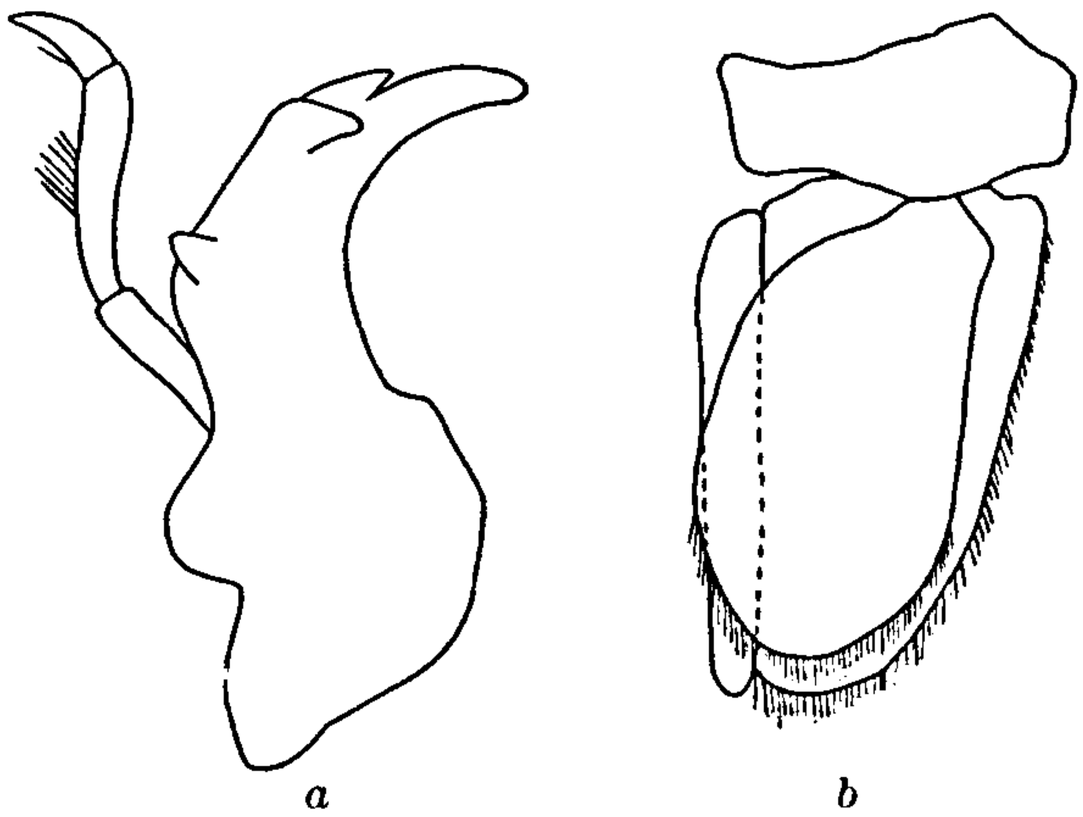


FIG. 122.—EXOCORALLANA MEXICANA. *a*, MANDIBLE. × 51⅔. *b*, SECOND PLEOPOD OF MALE × 27⅓.

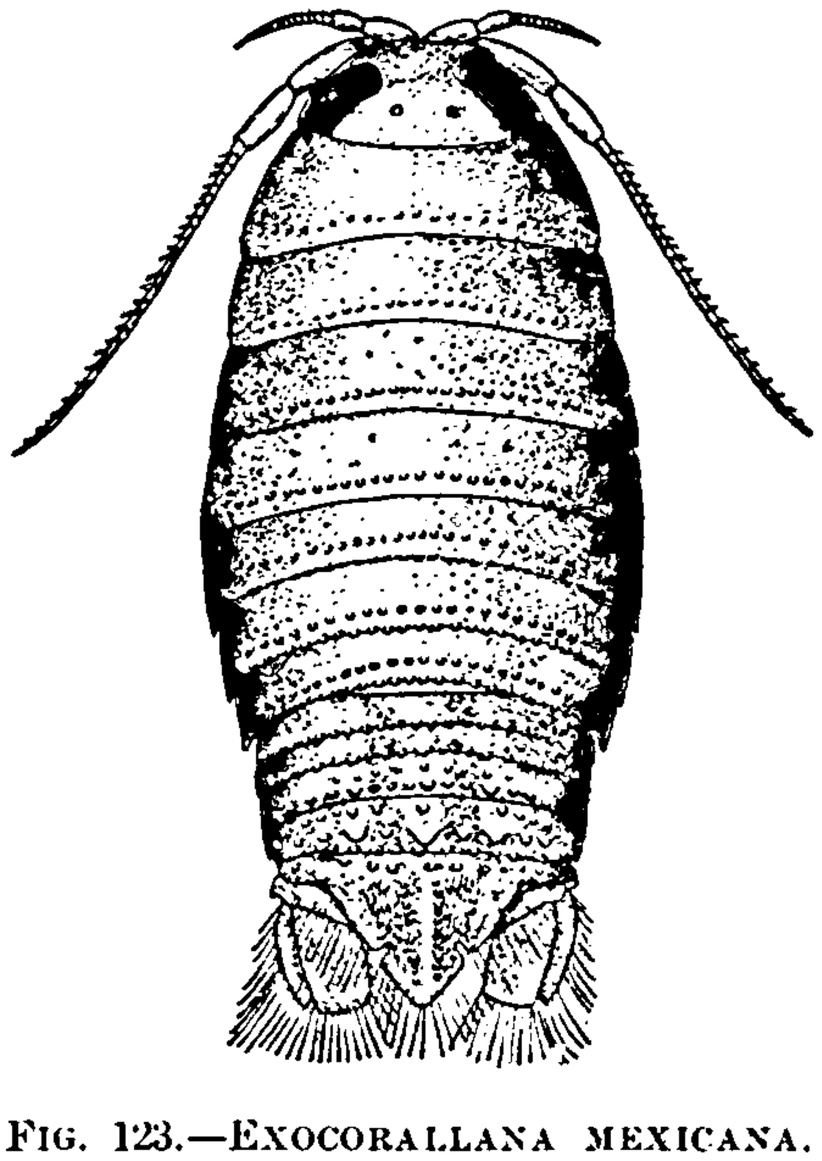


FIG. 123.—EXOCORALLANA MEXICANA. MALE. × 6.

The first segment of the thorax is about one and one-half times longer than any of the three following segments, which are subequal. The fifth, sixth, and seventh segments are subequal and shorter than the preceding segments, and each is furnished with a double or single transverse row of small tubercles close to the posterior margin. The anterior segments are sometimes furnished with a rather indistinct row of tubercles on the posterior margin. The epimera are distinct on all the segments with the exception of the first; the first two are rounded posteriorly, the last four have the outer posterior angle gradually more acutely produced.

The first segment of the abdomen is entirely covered by the last thoracic segment, except a small portion in the middle. The four following segments are nearly subequal in length. The first two (the second and third) have a single transverse row of small tubercles close to the posterior margin. The fourth segment has a double transverse row of tubercles, the posterior row of tubercles being larger. The fifth segment has three transverse rows of tubercles, the middle row being the largest. The sixth or terminal segment of the abdomen is triangulate, with apex rounded and furnished with four spines. There is a lateral incision on either side, a little below the middle transverse line. At the base of the segment is a transverse row of small tubercles. Below this row are two groups of three tubercles each, a group on either side of the median line. There are also two small tubercles on either side of the segment just above the insertion of the uropods. On the posterior part of the segment is a double longitudinal line of small tubercles, one row on either side of the median line. Lateral to these tubercles is a setose area, one on either side. The uropoda are as long as the terminal segment. The inner branch is twice as wide as the outer branch and is truncately rounded and furnished with spines on the posterior margin. The outer branch is obtusely pointed. Both branches are furnished with hairs, as well as the terminal segment of the abdomen.

The type, a male, is from the Gulf of Mexico, station 2406, from a depth of 26 fathoms. Seven other specimens, all males, and thirteen females, are from between the delta of the Mississippi and Cedar Keys, Florida, and from the Gulf of Mexico. The type is in the U. S. National Museum, Cat. No. 32074.

The females differ from the males only in the shorter second antennæ, which extend only to the posterior margin of the third thoracic segment.

EXOCORALLANA SEXTICORNIS (Richardson).

Corallana sexticornis RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 518.

Locality.—Key West, Florida.

Head in the male ornamented with four spines, forming two transverse series of two spines each, the first two being small, the second two very large and long, much longer than the first two and situated behind them. The first antennæ have the basal joint large and dilated, with a spine projecting outward from the inner exposed angle; the flagellum consists of eight joints. The second antennæ with a flagellum of nineteen to twenty-one joints reach the posterior margin of the third thoracic segment. The head of the male is excavate above and deeply sunken below the level of the dorsal surface of the body. The head of the female is unornamented, with only a slight indication of two small tubercles in the place where the large spines are situated on the

head of the male. The basal joints of the first antennæ of the female are large and dilated, but without the prominent spine characteristic of the male.

The first thoracic segment in the male is ornamented with two small tubercles situated close together on the anterior portion. These tubercles are wanting in the female. The posterior segments of the thorax and the abdominal segments are densely tubercular.

The terminal segment of the body is pointed posteriorly, and fringed with hairs. The uropoda are about as long as the terminal

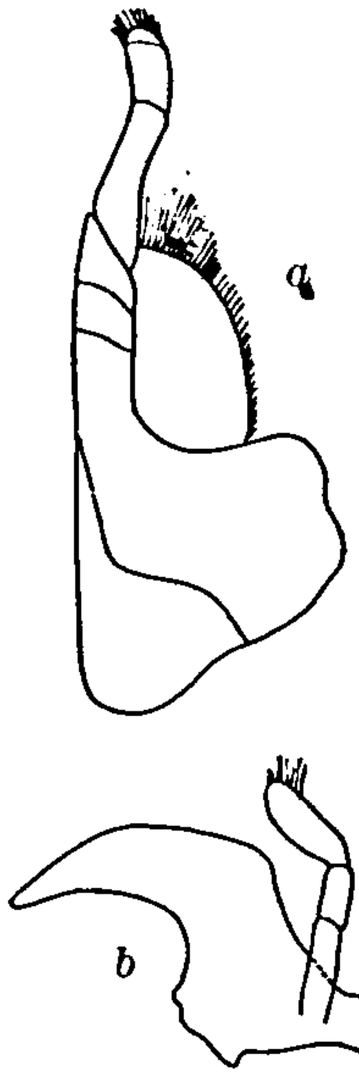


FIG. 124.—EXOCORALLANA SEXTICORNIS. *a*, MAXILLIPED. × 39. *b*, MANDIBLE. × 39.

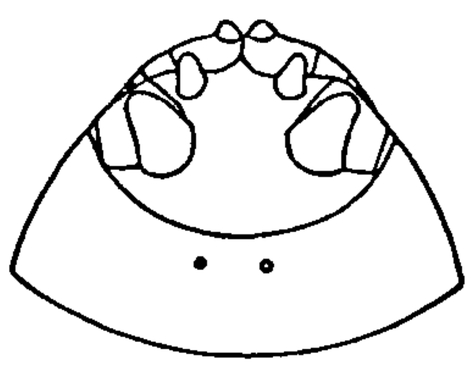


FIG. 125.—EXOCORALLANA SEXTICORNIS. HEAD AND FIRST THORACIC SEGMENT.

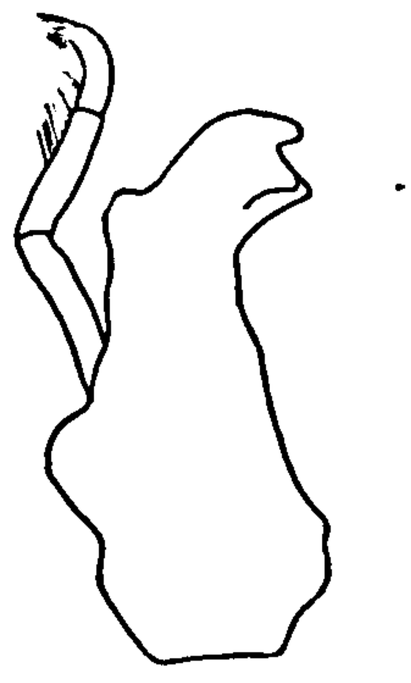


FIG. 126.—EXOCORALLANA SEXTICORNIS. MANDIBLE. × 51⅔.

segment, the outer branch narrow, the inner branch wide; both are fringed with hairs and armed with a few spines.

One male and a number of females were collected by Henry Hemphill at Key West, Florida.

Type.—Cat. No. 13540, U.S.N.M.

EXOCORALLANA QUADRICORNIS (Hansen).

Corallana quadricornis HANSEN, Vidensk. Selsk. Skr. (6), V, 1890, p. 382, pl. VII, fig. 3.—RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 518; Trans. Conn. Acad. Sci., XI, 1902, 290.

Localities.—St. Thomas, West Indies; Bermudas, at the Flatts; at Long Bird Island in the cavities of a massive, black keratose sponge, living on the grassy sand flats at low tide; Castle Harbor, in the same sponge.

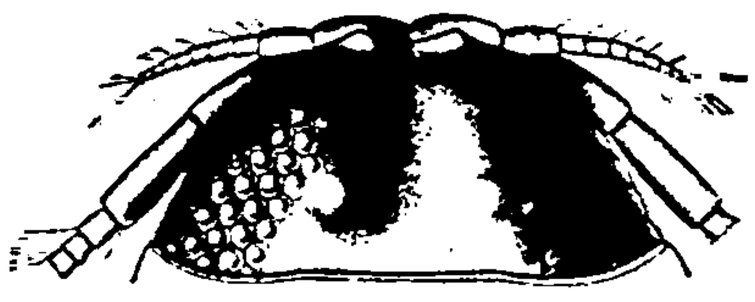


FIG. 127.—EXOCORALLANA QUADRICORNIS (AFTER HANSEN). HEAD. (ENLARGED.)

This species is very similar to *E. tricornis*, but differs in the following important characters: The clypeus, seen from below, is very narrow and concealed for the most part; the labrum is concealed by the mandibles. Half of the distal part of the mandibles is very prominent and obscurely trifid. The last segment of the abdomen is a little more impressed at the sides than in *E. tricornis*. The abdomen is less hairy, the apical part of the last segment less convex, ornamented, however, with four apical spines.

The male has the head excavated as in *E. tricornis*, and ornamented with two small frontal tubercles rather closer together, and two large suboccipital tubercles more widely separated. The head of the female is as in *E. tricornis*. The flagellum of the second pair of antennæ in the male is composed of sixteen articles; in the female of about twenty articles. [a]

EXOCORALLANA TRUNCATA (Richardson).

Corallana truncata RICHARDSON, Proc. U. S. Nat. Mus., XXI, 1899, p. 825; Ann. Mag. Nat. Hist. (7), IV, 1899, pp. 165–166.

Localities.—Catalina Island, California; off Magdalena Bay, Lower California.

Body elongate, about three and a half times longer than wide; color yellow.

Head with a small median point. Eyes large, situated but a little distance apart. First pair of antennæ, with a flagellum of about nine articles, extend to the antero-lateral angle of the first thoracic segment. Second pair of antennæ broken in specimen.

First segment of the thorax is as long as the head, and about one and a half times longer than any of the other segments. Epimera of the second and third segments narrow; those of the remaining segments very broad.

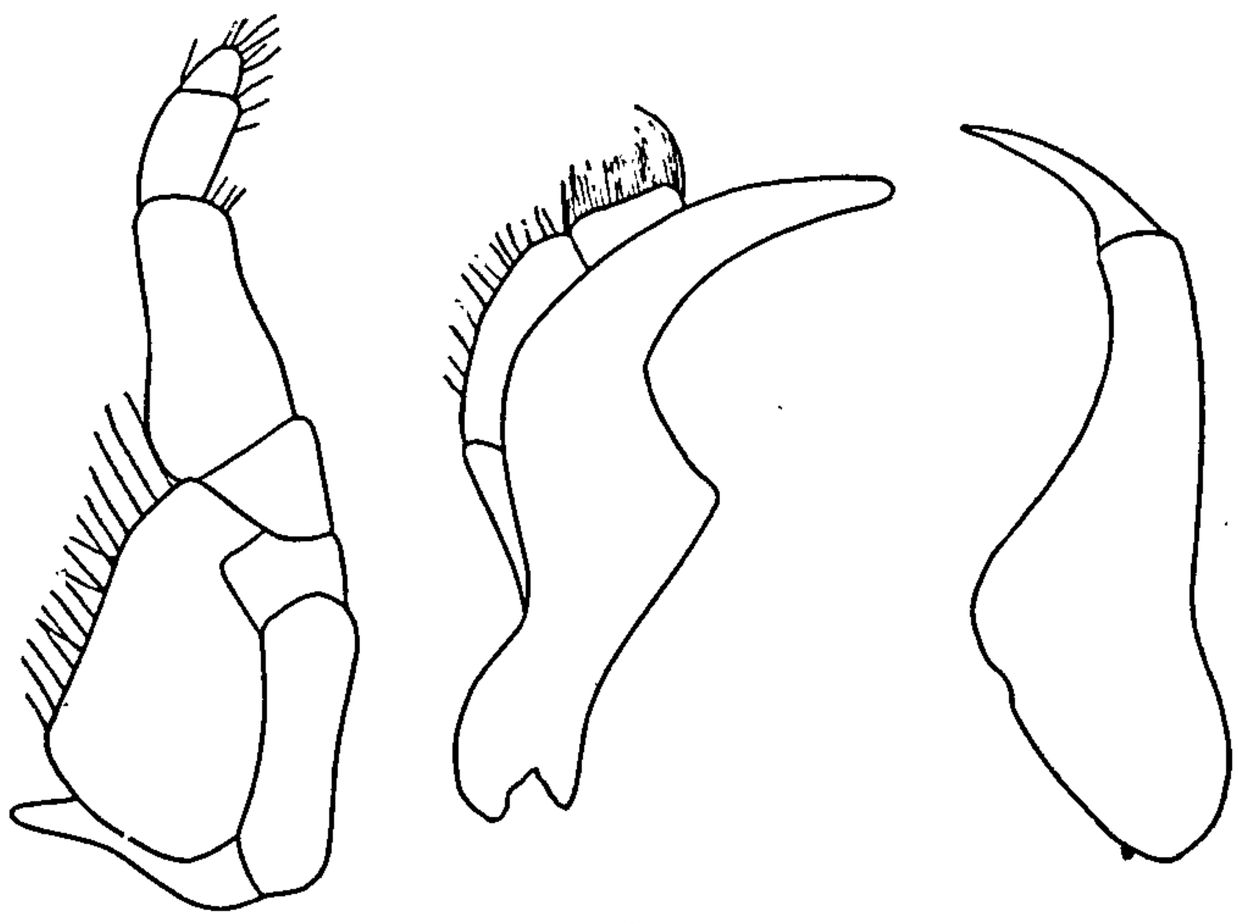


FIG. 128.—EXOCORALLANA TRUNCATA. *a*, MAXILLIPED. × 27½. *b*, MANDIBLE. × 27½. *c*, FIRST MAXILLA (OUTER LOBE). × 27½.

The first abdominal segment is almost entirely covered by the last thoracic segment. The second, third, and fourth segments are

[a] The above description is adapted from the following one of Hansen's:

Diagn. Speciei præcedenti (*C. tricornis*) valde affinis, characteribus sequentibus imprimis differt. Clypeus, infra visus, perangustus et ex parte obtectus; labrum a mandibulis obtectum. Mandibularum pars distalis dimidia sat alte eminens, obscurius trifida. Segmentum ultimum ad latera versus paulo magis impressum quam in specie præcedente (*C. tricornis*).

Mas: Caput ut in specie præcedente excavatum, cornibus duobus frontalibus minoribus, minus distantibus et cornibus duobus majoribus, suboccipitalibus, magis distantibus ornatum.—Long. 6, 3 mm.

Femina: Caput ut in specie præcedente.—Long. 6, 8 mm.

Descr. Hæc species *Cor. tricorni* simillima; characteres omnes graviores in diagnosi commemorati sunt. Præterea differt cauda minus hirsuta, parte apicali segmenti ultimi minus convexa, spinis tamen 4 apicalibus ornata. (Flagellum antennarum in mare 16—articulatum, in femina c. 20—articulatum.)—HANSEN, Vidensk. Selsk. Skr. (6), V, 1890, p. 382.

tuberculated on their posterior margins. The fifth segment is also tuberculated, the tubercles on either side of the median line of tubercles being larger and more conspicuous. At the base of the terminal segment are four tubercles, the two center ones being the largest. The terminal segment is subtriangular with truncate apex. The posterior margin is armed with spines. The inner branch of the uropoda is truncate posteriorly and armed with spines; it is about twice as broad as the outer branch, which is lanceolate in shape.

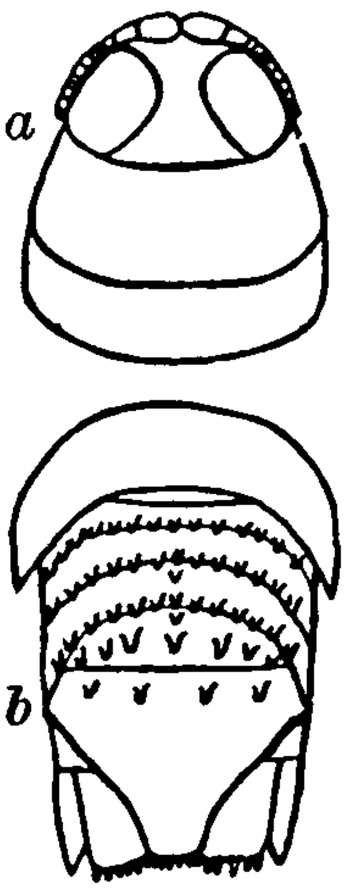


FIG. 129.—EXOCORALLANA TRUNCATA. × 13½. *a*, HEAD. *b*, ABDOMEN AND LAST THORACIC SEGMENT.

The type specimen is from Catalina Island, California; collected by Dr. J. G. Cooper.

Type.—Cat. No. 22566, U.S.N.M.

EXOCORALLANA SUBTILIS (Hansen).

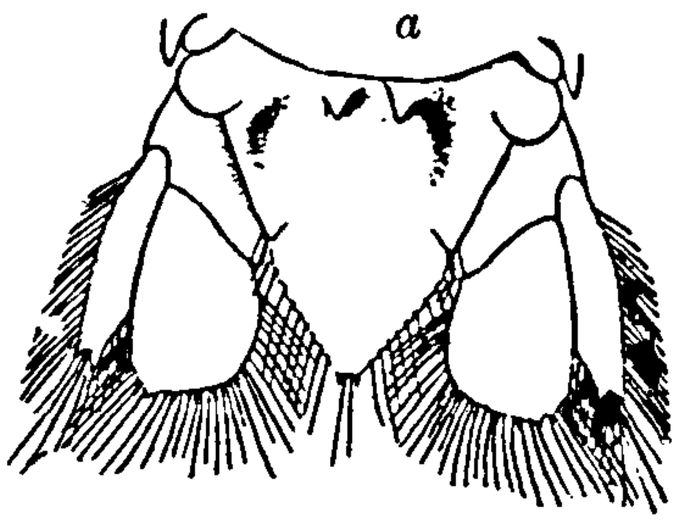
Corallana subtilis HANSEN, Vidensk. Selsk. Skr. (6), V, 1890, pp. 382–383, pl. VII, figs. 3–3c.—RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 519.

Locality.—St. Thomas, West Indies.

A single young specimen in the process of ecdysis was taken, and on that account is rather different from other species in appearance.

The front of the head is produced in a rather large triangular process. The first pair of antennæ have the basal article of the peduncle strongly dilated when seen from above; when seen from below it projects in such a way that the basal articles of the second antennæ are placed in a rather deep cleft between the first pair of antennæ and the mandibles. The first pair of antennæ have the second article of the peduncle slender; the flagellum is composed of about seven articles. The eyes are slightly granulated.

The frontal lamina is a little longer than wide, somewhat narrower toward the apex, with the apex rounded and superficially excavated.



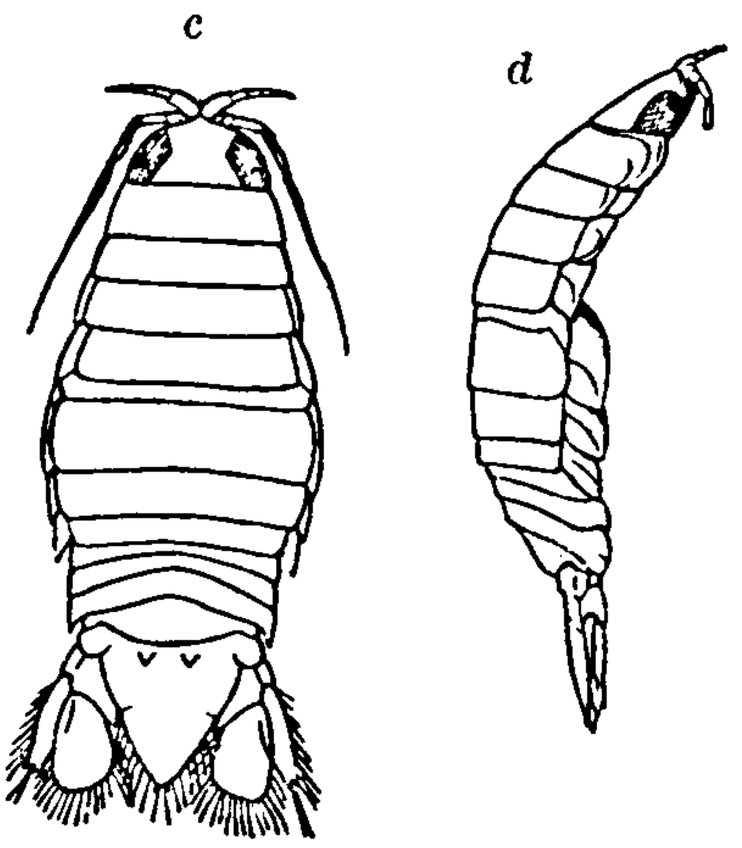


FIG. 130.—EXOCORALLANA SUBTILIS. (AFTER HANSEN). *a*, POSTERIOR PART OF ABDOMEN. × 16. *b*, HEAD. × 19. *c*, YOUNG SPECIMEN TAKEN IN PROCESS OF ECDYSIS. × ⅔. *d*, LATERAL VIEW OF SAME (RIGHT SIDE).

The clypeus is very narrow, partly concealed; the labrum is concealed.

The last segment of the abdomen is somewhat longer than in *E. quadricornis*, being a fourth part wider than long, bare above, and ornamented on the dorsal surface near the base with two large tubercles, separated a little; the sublateral impressions are deep; the apex is furnished with two spines.

The uropoda are wider than in *E. quadricornis;* the branches are ornamented with some long hairs and a few spines; the peduncle has the inner angle short, occupying about a third of the inner branch.

The color is dark black; the last segment of the abdomen and the uropoda are brown, ornamented with branching black spots.[a]

Two specimens, both males, from Florida, in the collection of the U. S. National Museum, I have referred to this species with some hesitation, as they lack the two large tubercles at the base of the terminal abdominal segment. They agree in other respects with Hansen's description of this species, but as Doctor Hansen's only specimen was a young specimen, very likely a female and taken in the process of ecdysis, I would hesitate to make a new species until I had more material.

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[a] The above description is adapted from the following description of Hansen's:

Diagn. Feminæ *Cor. quadricornis* subsimilis, tamen imprimis differt characteribus sequentibus. Oculi leviter granulati. Antennularum articulus basalis pedunculi pronus visus valde dilatatus, supinus visus ita prominens, ut articuli basales antennarum in rima sat profunda inter antennulas et mandibulas positi sint. Segmentum ultimum caudæ dorso prope basin nodis duobus magnis, paulum distantibus ornata, impressionibus sublateralibus profundis, apice spinis 2 instructo.—Long. 4, 7 mm.

Descr. Specimen singulum juvenile in mutatione cutis captum et ob eam causam a speciebus ceteris habitu sat diversum vidi. Characteres præcipui in diagnosi exhibiti sunt; præterea characteres sequentes commemorare possum.

Frons ante in processum trigonum sat magnum producta.

Lamina frontalis paulo longior quam latior, ad apicem versus nonnihil angustata, apice rotundato, superficie excavata.

Clypeus perangustatus, ex parte detectus, labrum obtectum. Antennulæ articulo secundo pedunculi gracili, flagello c. 7-articulato.

Segmentum ultimum caudæ nonnihil longius quam in speciebus præcedentibus (*C. quadricornis*), quarta parte latius quam longius, superne nudum.

Uropoda fere latiora quam in speciebus præcedentibus; rami setis nonnihil longioribus et spinis paucioribus ornati; scapus angulo interiore breviore, circiter tertiam partem rami interioris occupans.

Color fusco-piceus; segmentum ultimum caudæ et uropoda brunnea, maculis ramosis nigris ornata.—Hansen, Vidensk. Selsk. Skr. (6), V, 1890, pp. 382–383.

EXOCORALLANA ANTILLENSIS (Hansen).

Corallana antillensis HANSEN, Vidensk. Selsk. Skr. (6), V, 1890, pp. 383–384, pl. VII, figs. 4–4i.—RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 519.

Localities.—Key West, Florida; St. Thomas, West Indies.

On reefs, low tide.

Body oblong-ovate, a little more than three times longer than wide, 5 mm.: 16 mm.

Head wider than long, 2 mm.: 4 mm., with the anterior margin bisinuate on either side of a small median point. The eyes are large

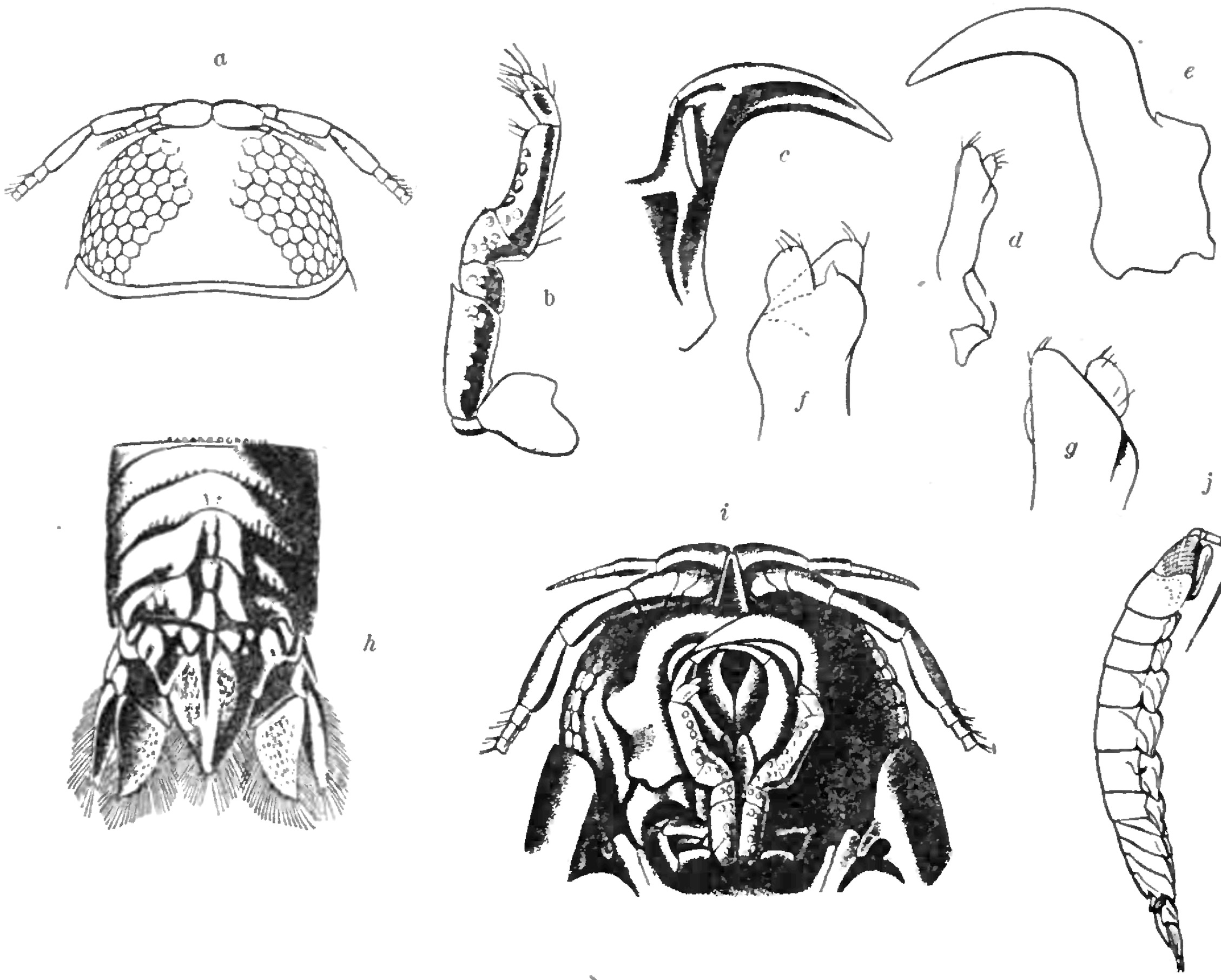

FIG. 131.—EXOCORALLANA ANTILLENSIS (AFTER HANSEN). *a*, HEAD OF ADULT MALE. × 11 (FROM ABOVE). *b*, LEFT MAXILLIPED OF SAME. × 24. *c*, LEFT MANDIBLE, PALP OMITTED (VENTRAL SIDE). × 24. *d*, LEFT MAXILLA (SECOND PAIR). × 24. *e*, LEFT MANDIBLE (BASAL PART OMITTED). × 24 (FROM ABOVE). *f*, DISTAL PART OF LEFT MAXILLA OF SECOND PAIR (VENTRAL SIDE). × 59. *g*, DISTAL PART OF SAME (FROM ABOVE). *h*, ABDOMEN. × 6. *i*, HEAD (VENTRAL SIDE). × 11. *j*, ADULT MALE (LATERAL VIEW). × $\frac{11}{4}$.

and composite, but are not contiguous, being separated by a distance equal to half the length of one eye. The basal article of the antennæ is very much dilated and very large; the second article is fused with the first; the third article is small and narrow, half as long as the first and about one-third as wide. The flagellum is composed of ten articles. The first antennæ extend to the middle of the fifth article of the peduncle of the second antennæ. The second pair of antennæ have the first two articles short and subequal; the third article is equal in length

to the first two taken together; the fourth and fifth are subequal and each is nearly twice as long as the third. The flagellum is composed of thirty-two articles. The second pair of antennæ extend to the posterior margin of the third thoracic segment. The maxilliped is composed of seven articles. The palp of the mandibles is composed of three articles. The frontal lamina is narrow and long, and has the anterior extremity rounded.

The first segment of the thorax is nearly twice as long as any of those following. The seventh is a little shorter than the sixth. The epimera are distinct on all the segments with the exception of the first. An arched carina crosses all the epimera obliquely. The outer post-lateral angle of the first two epimera is rounded; that of the last two acutely produced beyond the posterior margin of the segments.

The first segment of the abdomen is partly concealed by the seventh thoracic segment. The posterior margin of the second, third, fourth, and fifth segments is tuberculate. On all of these segments there is a

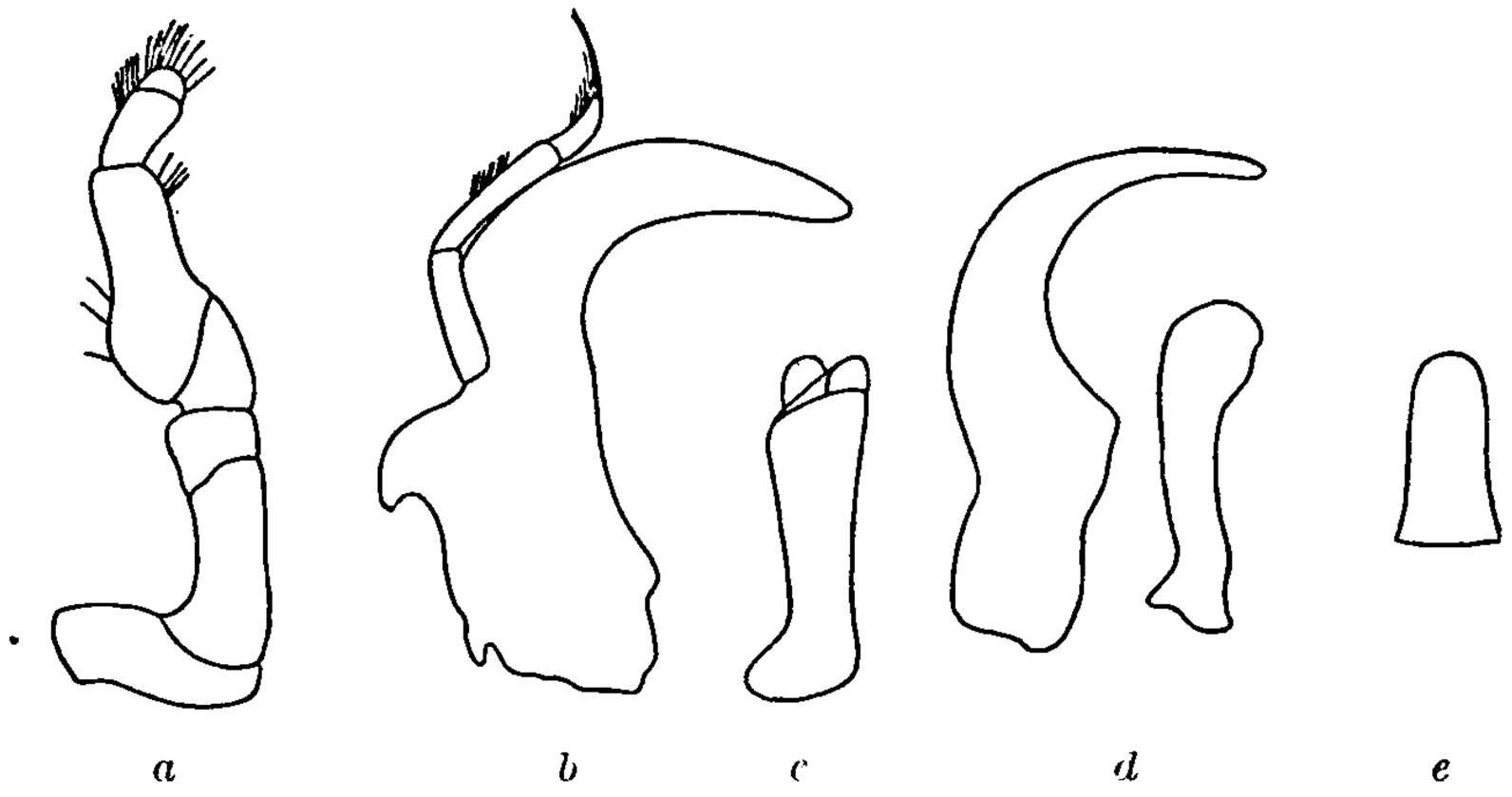

FIG. 132.—EXOCORALLANA ANTILLENSIS. *a*, MAXILLIPED. × 27½. *b*, MANDIBLE. × 27½. *c*, SECOND MAXILLA. × 27½. *d*, FIRST MAXILLA (OUTER AND INNER LOBE). × 27½. *e*, FRONTAL LAMINA. × 27½.

median depression, in the center of which is a small tubercle, one for each segment, with the exception of the fifth, which has two tubercles in longitudinal series. The sixth or terminal segment is triangular with apex acute and furnished with a few short spines. There is a median longitudinal depression extending the length of the segment, on either side of which the dorsal surface is hirsute. At the base of the segment are two tubercles, one on either side of the median depression. On either side of these, near the lateral margin and at the base of the segment, are two other tubercles, the one nearest the lateral margin being a little anterior to the other. Halfway between the base and the apex of the segment the lateral margin is cleft on either side. The inner branch of the uropoda is wide and has the outer post-lateral angle produced in an acute tooth; the inner posterior margin is crenulate and armed with spines. The outer branch is as long as the inner branch, is half as wide, and is produced in an extremity terminating in two subequal teeth. The inner angle of the peduncle extends a

little beyond the incision in the lateral margin of the terminal abdominal segment.

The first three pairs of legs are prehensile, the last four pairs ambulatory.

EXOCORALLANA FISSICAUDA (Hansen).

Corallana fissicauda HANSEN, Vidensk. Selsk. Skr. (6), V, 1890, pp. 385–386, pl. VII, figs. 5–5d.—RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 519.

Locality.—West Indies.

The body is almost three times longer than wide; the thorax is somewhat longer than the abdomen.

The front of the head has the margin straight, the median process is bent, having almost disappeared.

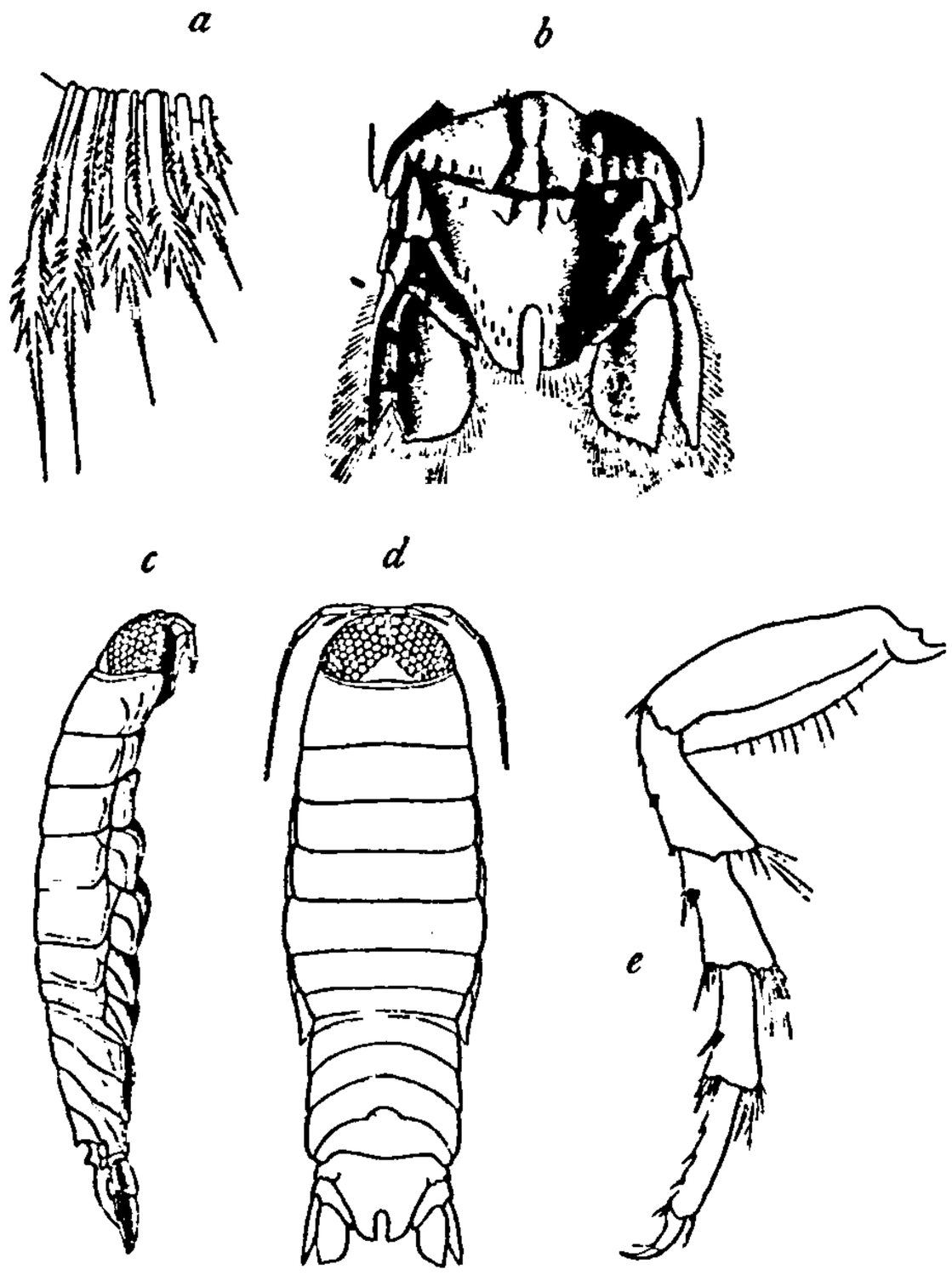

FIG. 133.—EXOCORALLANA FISSICAUDA (AFTER HANSEN). *a*, FEMALE. *b*, LATERAL VIEW. *c*, LEG OF SEVENTH PAIR. *d*, APEX OF FIFTH ARTICLE OF SEVENTH LEG, BEARING SETÆ. *e*, POSTERIOR PART OF ABDOMEN WITH UROPODA. (ENLARGED.)

The eyes are black, very large, occupying the entire surface of the head with the exception of a small median area at the posterior margin; the ocelli are very large, semispherical, and formed as in *E. warmingii*.

The frontal lamina is almost three times longer than wide, becoming narrower from the base to the middle, excavated through the greater part of its length, with the apical part flat, and rounded anteriorly. The lamina seen from the side is curved outward and near the apex curved inward.

The clypeus seen from below is very manifest for the most part; the labrum is concealed.

The first pair of antennæ extend to about the apex of the penultimate article of the peduncle of the second pair of antennæ; the peduncle has the first article somewhat stout, narrow, however, when seen from above and below; the second article is somewhat shorter than the first and more slender; the flagellum is somewhat shorter than the peduncle and is composed of about eight articles.

The second pair of antennæ are of the usual structure.

The mandibles are large, robust; the distal part of the left mandible is very conspicuous, forming a single cone.

The maxillipeds are almost as in *E. antillensis.*

The segments of the thorax are almost as in *E. antillensis;* the postmarginal furrow is well defined only in the seventh segment; in the fourth, fifth, and sixth segments it is somewhat distinct, formed principally of points.

The epimera are almost as in *E. antillensis.*

The first five segments of the abdomen are a little more smoothly formed than in *E. antillensis.*

The last segment of the abdomen is short, about two-fifths wider than long, posteriorly widely rounded, not furnished with spines, but furnished with a deep and rather wide median incision, the lateral margin is entire; the dorsal surface is rather convex, not furnished with densely setose areas, but ornamented with very short, scattered hairs near the lateral margins, and furnished near the base with a median excavation which has a carina in a rather short fundus, and ornamented with acute tubercles rather close together and rather small, and with lateral tubercles somewhat smaller than in *E. antillensis* and not furcate.

The uropoda extend some distance beyond the abdomen and are furnished with hairs as in *E. antillensis;* the branches are equal in length; the inner branch is rather wide, with the posterior part of the inner margin somewhat curved outward, and furnished with a few spines; the apex is a little produced and acute.

The peduncle has the inner angle extending a little beyond a third part of the inner branch. The color is brownish yellow.[a]

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[a] The above description is adapted from the following one of Hansen's:

Diagn. Clypeus, supinus visus, ex parte perspicuus, labrum obtectum. Antennularum articulus basalis nonnihil incrassatus, pronus et supinus visus angustus. Segmenta 5 anteriora caudæ fere ut in *Cor. antillensi.* Segmentum ultimum caudæ breve, postice late rotundatum et incisura media profunda, sat lata, instructum, margine laterali non inciso, dorso ad basin nodis et nodulis ornato, areis spisse setosis nullis. Uropoda caudam longe superantia, structura fere solita. Long. 11 mm.

Corpus fere triplo longius quam latius; truncus cauda aliquanto longior.

Frons margine subrecto, processu medio inflexo, fere evanido.

Oculi nigri, permagni, superficiem totam capitis præter aream minorem mediam ad marginem posteriorem occupantes; ocelli permagni, semiglobosi, ut in *C. Warmingii* formati.

Lamina frontalis fere triplo longior quam latior, a basi ad mediam angustata, per longitudinem majorem excavata, parte apicali subplana, ante rotundata. Lamina a latere visa excurvata et prope apicem incurva.

Clypeus supinus visus ex parte perspicuus; labrum obtectum.

Antennulæ circiter apicem articuli penultimi pedunculi antennarum attingentes; pedunculus articulo primo nonnihil incrassato, prono et supino viso tamen angusto, articulo secundo aliquanto breviore quam primo, graciliore; flagellum pedunculo aliquanto brevior, c. 8-articulatum.

Antennæ structura solita. Mandibulæ magnæ, robustæ, pars distalis mandibulæ sinistræ sat alte eminens, ut in speciebus sequentibus conum singulum formans.

Maxillipeds fere ut in *C. antillensi.*

Segmenta trunci fere ut in *C. antillensi;* stria postmarginalis solum in segmento

EXOCORALLANA OCULATA (Hansen).

Corallana oculata HANSEN, Vidensk. Selsk. Skr. (6), V, 1890, pp. 386–387, pl. VII, figs. 6–6b.—RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 519.

Locality.—West Indies.

The body is about three times longer than wide; the last four segments of the thorax, especially toward the posterior margin, and the second to the fifth segments of the abdomen in the male are nearly bare, in the female they are rough and furnished with very short stiff hairs; the thorax in the male is a little longer and in the female is somewhat longer than the abdomen.

The front of the head is as in *E. fissicauda*.

The eyes are almost as in *E. fissicauda*, being somewhat larger in the male and more convex than in the female; the ocelli are very large in the male and very convex, in the female they are a little less convex.

The frontal lamina is as in *E. fissicauda*.

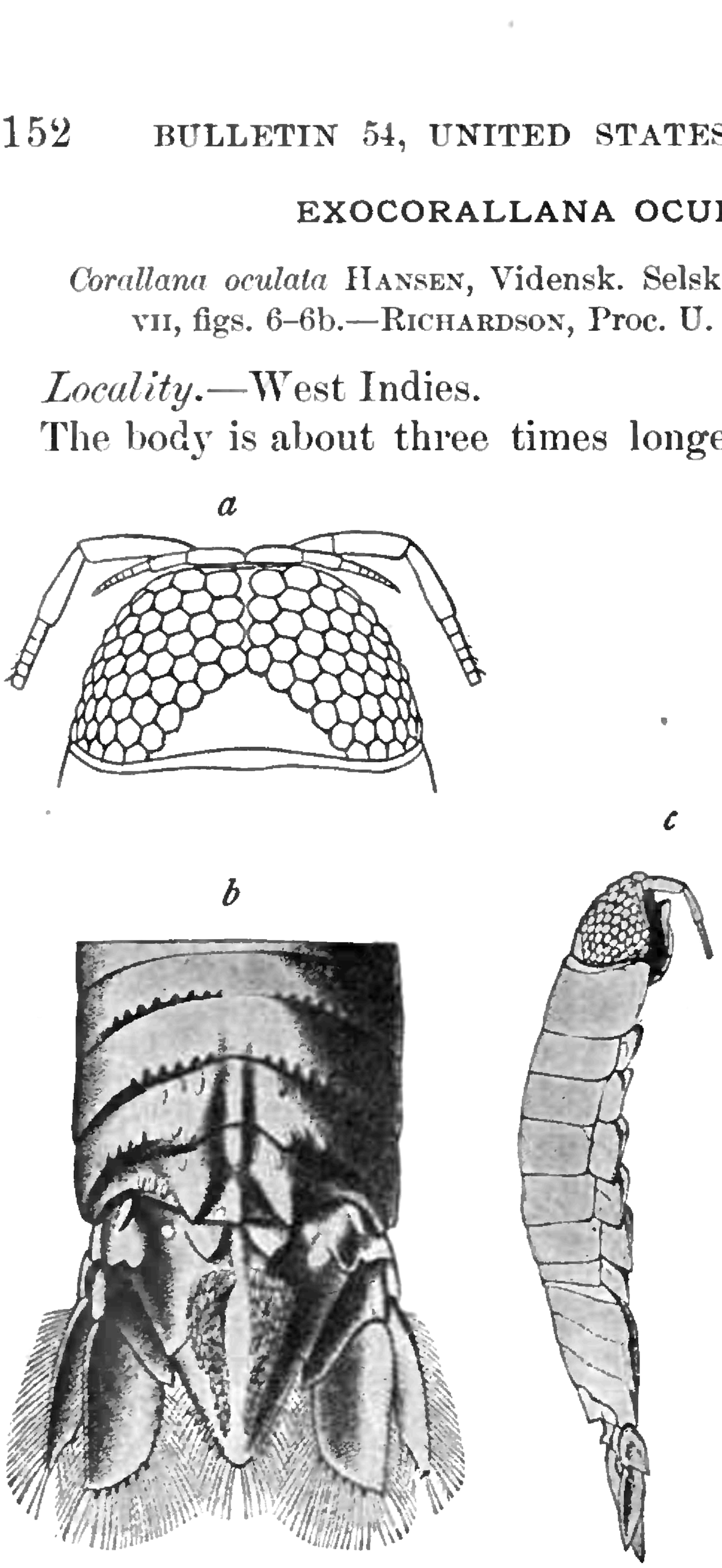

FIG. 134.—EXOCORALLANA OCULATA (AFTER HANSEN). *a*, HEAD OF ADULT MALE. *b*, ABDOMEN OF ADULT MALE. *c*, LATERAL VIEW OF ADULT MALE. (ENLARGED.)

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septimo bene definito, in segmentis sexto et quinto et quarto paulum distincta, imprimis e punctis formata.

Epimera et pedes fere ut in *C. antillensi.*

Segmenta 5 anteriora caudæ paulo levius sculpta quam in *C. antillensi.*

Segmentum ultimum caudæ abbreviatum, circiter $\frac{2}{5}$ latius quam longius, postice late rotundatum, non spinosum, ibique incisura profunda et sat lata ornatum, margine laterali integro; dorsum sat convexum, areis nullis spisse setosis instructum, setis brevissimis remotius sparsis ad margines laterales versus ornatum, excavatione basali media in fundo breviore carinata, nodis acutis sat approximatis nonnihil minoribus, nodis lateralibus aliquanto minoribus quam in specie præcedente et non furcatis instructum.

Uropoda caudam valde superantia, ut in *C. antillensi* ciliata; rami inter se æquilongi; ramus interior sat latus, margine postero-interiore aliquantum excurvato spinis nonnullis instructo, apice paulum producto, acuto. Scapus angulo interiore paulum ultra tertiam partem rami interioris occupans.

Color flavo-brunneus.—HANSEN, Vidensk. Selsk. Skr. (6), V, 1890, pp. 385–386.

The clypeus is very narrow, very manifest when seen from below; the labrum is partly concealed by the mandibles.

The first and second pair of antennæ are as in *E. fissicauda*.

The mandibles in the male are more prominent than in the female.

The maxillipeds are furnished below with numerous little knots, for the most part acute.

The first two or three segments of the thorax have rather distinct postmarginal furrows; the furrows on the posterior segments in the male are quite distinct, in the female they are obscured more or less by hairs.

The epimera and the legs are almost as in *E. antillensis*.

The five anterior segments of the abdomen are formed almost as in *E. antillensis*. The last segment of the abdomen is almost as in *E. antillensis*, but differs from that species especially in having the median excavation at the base shorter, the lateral tubercles rather narrower, the apex furnished with five spines, and subacute, the lateral margin not incised in the middle, and the dorsal surface furnished with two thickly setose areas.

The uropoda extend somewhat beyond the abdomen; the inner branch extends a little beyond the outer branch, is almost twice as long as wide, and has the inner posterior margin rather curved, furnished with spines and long hairs, the apex a little produced and acute. The peduncle has the inner angle somewhat exceeding a third part of the inner branch.

The color is a brownish yellow. The male appendix is almost as in *E. tricornis*. [a]

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[a] The above description is adapted from the following one of Hansen's:

Diagn. *Cor. fissicaudæ* valde similis, segmento ultimo caudæ fere ut in *C. antillensi* formato, longiore, apice subacuto, margine laterali in medio non inciso, dorso areis duabus spisse setosis instructo, imprimis ab ea specie diversa. Long. maris 9, 7 mm., long. feminæ 11, 5 mm.

Corpus circiter triplo longius quam latius; segmenta 4 posteriora trunci imprimis ad marginem posteriorem versus et segmenta 2–5 caudæ in mare fere nuda, in femina scabra, setis brevissimis, rigidis instructa; truncus in mare paulo longior et in femina nonnihil longior quam cauda.

Frons ut in specie præcedente (*C. fissicauda*).

Oculi fere ut in specie præcedente, in mare nonnihil majores et plus convexi quam in femina; ocelli permagni in mare valde convexi, in femina paulo minus convexi.

Lamina frontalis ut in *Cor. fissicauda*.

Clypeus perangustus, supinus visus perspicuus; labrum ex parte a mandibulis tectum.

Antennulæ et antennæ ut in *Cor. fissicauda*.

Mandibulæ in mare plus prominentes quam in femina.

Maxillipedes subtus nodulis compluribus ex parte acutis armati.

Segmenta duo vel tria anteriora trunci stria postmarginali paulum distincta;

EXOCORALLANA WARMINGII (Hansen).

Corallana warmingii HANSEN, Vidensk. Selsk. Skr. (6), V, 1890, pp. 387–388, pl. VII, figs. 7–7f.—RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 519.

Localities.—Off Cape Catoche, Yucatan; latitude 17° 47′ south, longitude 35° 17′ west.

Depth.—24 fathoms.

Body oblong-ovate, three times longer than wide, 3 mm.:9 mm. Head wider than long, 1 mm.:2 mm., with the anterior margin widely rounded. Eyes large, composite, contiguous, and occupying the greater part of the dorsal surface of the head. The first pair of antennæ have the first two articles confluent and scarcely to be distinguished from each other; they are subequal in length; the third article is equal to the second in length. The flagellum is composed of nine articles. The first antennæ extend almost to the middle of the fifth peduncular article of the second antennæ. The first two articles of the second pair of antennæ are short, the second one being a little shorter than the first; the third article is about equal to the first two taken together; the fourth and fifth are subequal and each is twice as long as the third. The flagellum is composed of twenty-five articles. The second antennæ extend almost to the posterior margin of the third thoracic segment. The maxilliped is composed of seven articles. The mandible has a palp of three articles. The frontal lamina is narrow and has the anterior margin rounded.

The first segment of the thorax is twice as long as any of the four following segments; the sixth and seventh segments are shorter than the fifth, the seventh being very short. The epimera of all the segments, with the exception of the first, are distinct, the last four being crossed obliquely by an arched carina. The outer post-lateral angles of the first two are rounded, those of the last two acutely produced beyond the posterior margin of the segments.

The first segment of the abdomen is entirely concealed by the last thoracic segment. The posterior margin of the four following seg-

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segmenta posteriora stria in mare bene distincta, in femina a setis plus minusve abscondita.

Epimera et pedes fere ut in *Cor. antillensi.*

Segmenta 5 anteriora fere ut in *C. antillensi* sculpta.

Segmentum ultimum caudæ fere ut in *C. antillensi*, excavatione media basali breviore, nodis lateralibus magnis angustioribus, apice 5 spinoso imprimis ab ea specie discrepans.

Uropoda caudam nonnihil superantia; ramus interior ramum exteriorem paulum superans. fere duplo longior quam latior, margine postero-interiore sat excurvato, sat spinoso, longe ciliato, apice paulum producto, acuto. Scapus angulo interiore partem tertiam basalem rami interioris nonnihil superante.

Color flavo-brunnescens. Appendix masculina fere ut in *C. tricorni.*—HANSEN, Vidensk. Selsk. Skr. (6), V, 1890, pp. 386–387.

ments is slightly tuberculate. The terminal segment is perfectly smooth on its dorsal surface, is produced to a narrow extremity, which is rounded, and has the posterior margin crenulate, the crenulations at the apex taking the form of five teeth. The inner branch of the

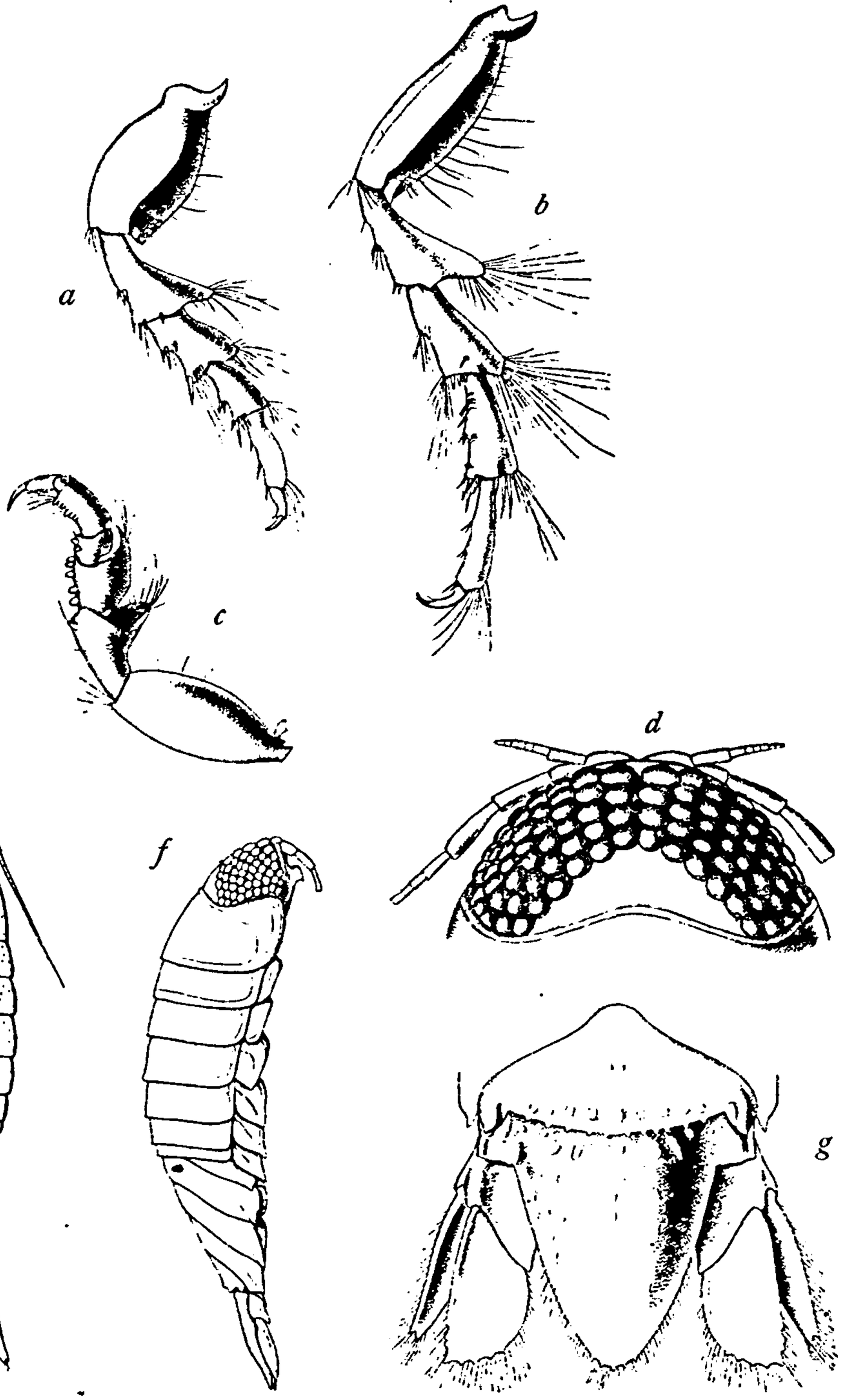

FIG. 135.—EXOCORALLANA WARMINGII (AFTER HANSEN). *a*, LEG OF FIFTH PAIR. *b*, LEG OF SEVENTH PAIR. *c*, LEG OF SECOND PAIR. *d*, HEAD. *e*, DORSAL VIEW OF MALE. *f*, LATERAL VIEW OF MALE. *g*, POSTERIOR PART OF ABDOMEN. (ENLARGED.)

uropoda is broad, with the inner angle of the posterior end broadly rounded, the outer angle terminating in an acute tooth; the posterior and exterior margins are slightly crenulate. The outer branch is narrow, less than half the width of the inner branch, is a little shorter

than the inner branch, and terminates in two acute teeth, the inner one being the larger and longer one.

The first three pairs of legs are prehensile, the last four pairs ambulatory.

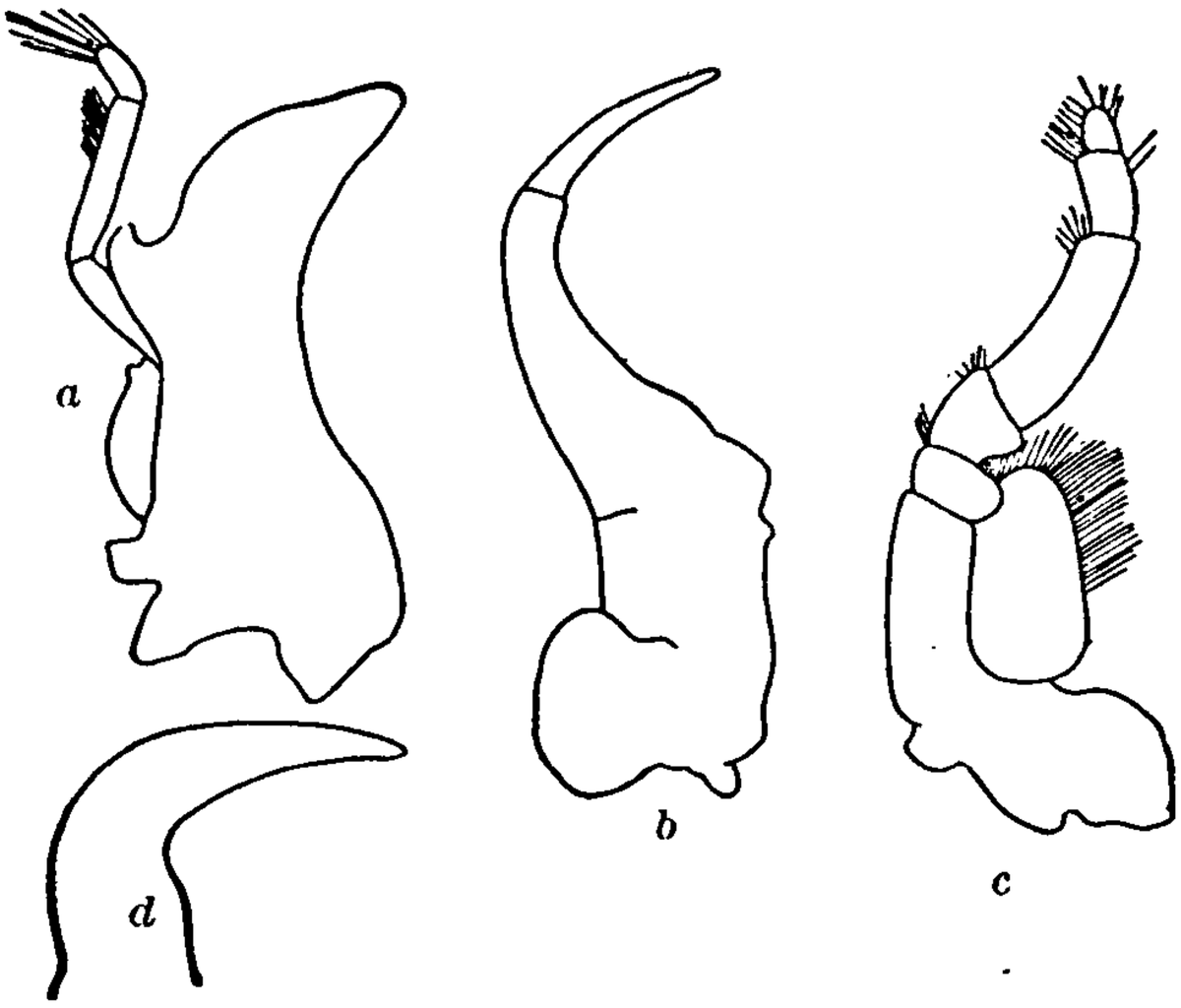

FIG. 136.—EXOCORALLANA WARMINGII. *a*, MANDIBLE. × 38¾. *b*, OUTER LAMELLA OF FIRST MAXILLA. × 38¾. *c*, MAXILLIPED. × 38¾. *d*, TIP OF MANDIBLE. × 38¾.

Family VII. CORALLANIDÆ.[a]

Mandibles becoming narrower toward the anterior part and manifestly directed inward. Apical part narrow, hidden under the clypeus, labrum, and paragnathia. Cutting edge short. Apical tooth of mandibles not greatly produced. Movable lacinia small or vanishing; molar part very often vanishing, sometimes well developed. Apex of second maxillæ simple. First maxillæ with the lacinia of the first article unarmed; the lacinia of the third article becoming more or less narrower from about the middle to the apex; apex furnished with few spines. Antepenultimate article of the maxillipeds not longer than broad. Labrum small, transverse.

ANALYTICAL KEY TO THE GENERA OF THE FAMILY CORALLANIDÆ.

a. First maxillæ with the apex of the third article furnished with more than one spine. Lacinia of first article narrow, elongate, with apex unarmed.

b. First maxillæ with the apex of the third article furnished with two spines. Molar part of mandibles wanting. Second maxillæ simple; laciniæ not distinct. Clypeus long and wide, semilunar in shape....Genus *Alcirona* Hansen

b′. First maxillæ with the apex of the third article furnished with three spines. Molar part of mandibles well developed. Second maxillæ indistinctly bilobed. Clypeus short and wide, in the form of an inverted v.

Genus *Tridentella*, new genus

a′. First maxillæ with the apex of the third article furnished with a single, long, robust, inwardly-curved spine. Lacinia of first article in the form of a quadrate curve-faced cap furnished with papillæ and covering tip of first article. Second maxillæ four-jointed; first two joints stout; third joint stout and subconical; terminal joint slender and conical.....Genus *Nalicora* Moore

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[a] See Hansen for characters of family. Vidensk. Selsk. Skr. (6), V, 1890, pp. 312–313, 317, 390, and Stebbing, Fauna and Geography of the Maldive and Laccadive Archipelagoes, II, Pt. 3, 1904, p. 703.

27. Genus ALCIRONA Hansen.

Peduncle of the first pair of antennæ composed of two articles.

First maxillæ with the apex of the third article furnished with two spines. Second maxillæ simple, laciniæ not distinct.

Mandibles becoming narrower from the base to the apex; movable lacinia very small or wanting, molar part absent.

Clypeus very large, long, and very wide, semilunar in shape, with the post-lateral angle reaching beyond the middle of the mandibles and almost to the articulation of the mandibular palp.

ANALYTICAL KEY TO THE SPECIES OF THE GENUS ALCIRONA.

a. First pair of antennæ, with flagellum of seventeen articles, extend to the end of the fifth article of the peduncle of the second pair of antennæ. Second pair of antennæ, with flagellum of thirty-five articles, extend to the posterior margin of the seventh thoracic segment. The first article of the peduncle of the second antennæ is twice as long as the second; the third is as long as the first; the fourth is twice as long as the third; the fifth is twice as long as the fourth. Last three segments of thorax with rows of stiff hairs on the posterior margin, and all the segments of the abdomen and the uropoda are covered with short stiff hairs ..... *Alcirona krebsii* Hansen

a'. First pair of antennæ, with flagellum of seven articles, extend to the end of the fourth article of the peduncle of the second pair of antennæ. Second pair of antennæ, with flagellum of seventeen articles, extend to the middle of the third thoracic segment. The first three articles of the peduncle of the first pair of antennæ are short, the fourth and fifth articles subequal and each about twice as long as the third article. Last five segments of thorax with rows of stiff hairs, and all the segments of the abdomen and the uropoda covered with short stiff hairs ..... *Alcirona hirsuta* Moore

ALCIRONA KREBSII Hansen.

Alcirona krebsii Hansen, Vidensk. Selsk. Skr. (6), V, 1890, pp. 391–392, pl. VIII, figs. 1–1q.—Richardson, Proc. U. S. Nat. Mus., XXIII, 1901, p. 519; Trans. Conn. Acad. Sci., XI, 1902, p. 290.

Localities.—Off Cape Catoche, Yucatan; St. Thomas, West Indies; Castle Harbor, Bermudas, in the cavities of living bathing sponges and in dead coral. Two specimens were taken from the fins of a Hamlet Grouper.

Depth.—25–28 fathoms.

Body oblong-ovate, a little more than twice as long as wide, 5 mm.: 11 mm. Head wider than long, 1 mm.: 2 mm., with the anterior margin rounded. Eyes small, round, composite, and situated in the antero-lateral angles of the head. The first pair of antennæ have the first article long; the second is fused with the first; the third is longer than the first. The flagellum is composed of eighteen articles. The first antennæ extend almost to the end of the fifth article of the peduncle of the second antennæ. The second pair of antennæ have the first article

twice as long as the second; the third is as long as the first; the fourth is twice as long as the third; the fifth is twice as long as the fourth. The flagellum is composed of thirty-nine articles. The second pair of antennæ extend to the posterior margin of the seventh thoracic segment; the peduncle extends to the posterior margin of the first thoracic segment. The maxilliped is composed of seven articles. The palp of the mandibles is composed of three articles. The frontal lamina has the anterior portion broad, the posterior end attenuated; the anterior margin is triangulate.

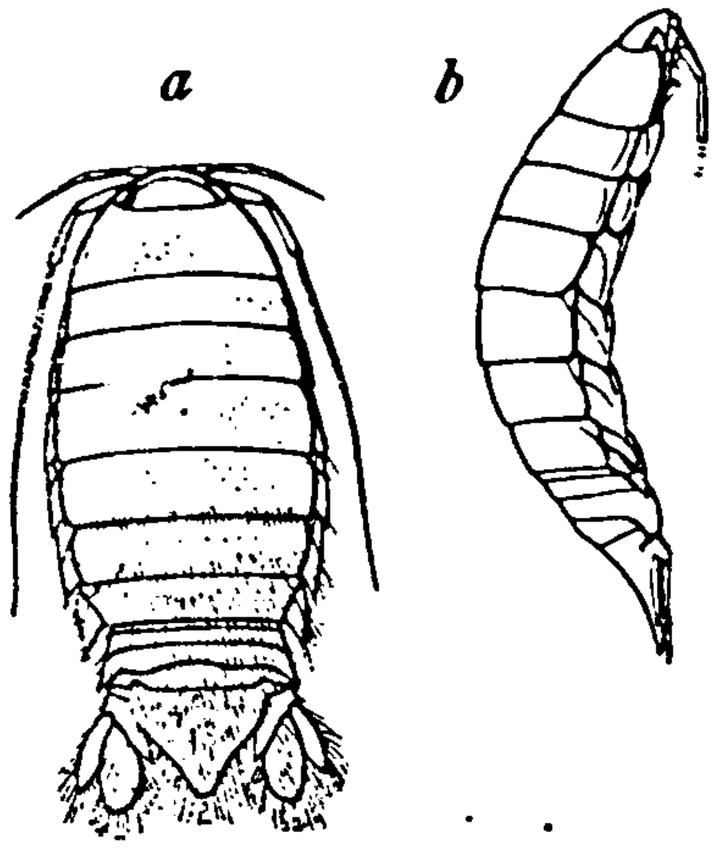

FIG. 137.—ALCIRONA KREBSII (AFTER HANSEN). *a*, DORSAL VIEW OF MALE. × 15/4. *b*, LATERAL VIEW OF ADULT MALE. × 15/4.

The first segment of the thorax is one and a half times longer than any of those following. The epimera are distinct on all the segments, with the exception of the first. The last four are crossed obliquely by an arched carina; the first two are crossed longitudinally. The outer post-lateral angles of the first two epimera are rounded; those of the last two are acutely produced beyond the posterior margins of the segments. The last three segments of the thorax are covered with short stiff hairs.

The first two segments of the abdomen are entirely concealed by the seventh thoracic segment. The sixth or terminal segment is triangular in shape, with the apex narrowly rounded and furnished with six spines. The entire abdomen is densely covered with short stiff hairs or bristles. The inner branch of the uropoda is broad and widely rounded at the posterior extremity; it extends as far as the extremity of the abdomen. The outer branch is as long as the inner branch, is half as wide, and has the extremity narrow. The margins of both branches are furnished with spines, and stiff hairs or bristles densely cover the whole dorsal surface. The inner angle of the peduncle is produced and extends a little beyond the middle of the terminal abdominal segment.

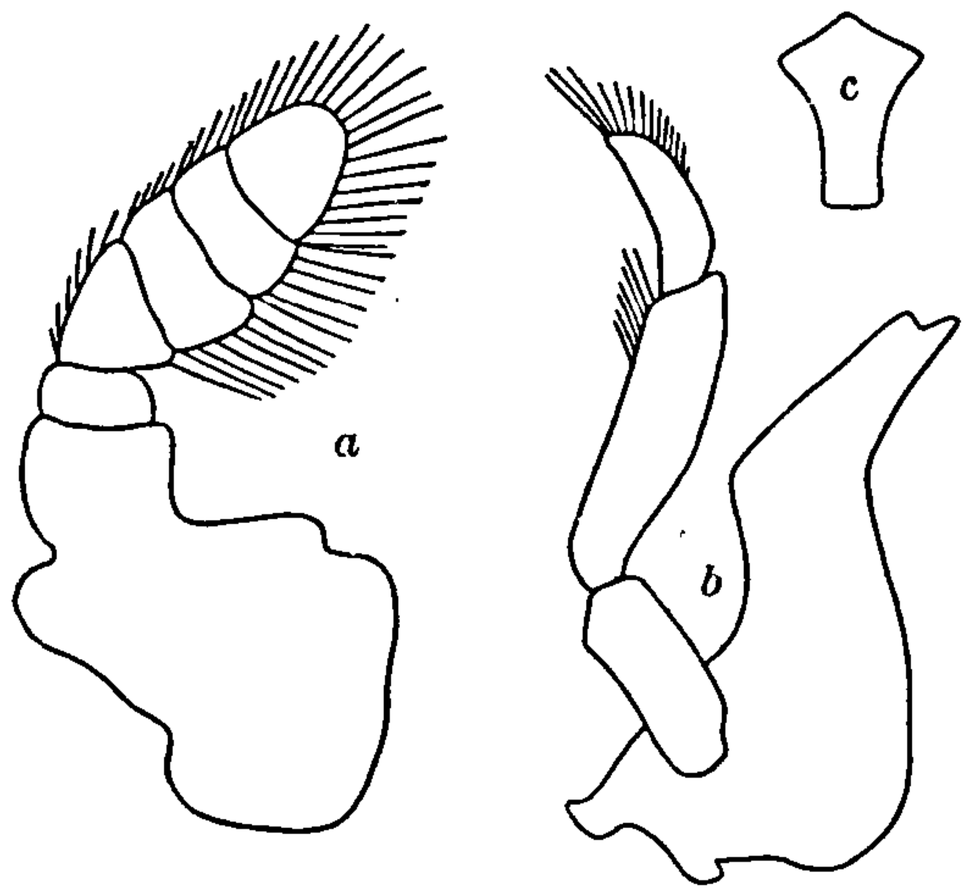

FIG. 138.—ALCIRONA KREBSII. *a*, MAXILLIPED. × 51⅔. *b*, MANDIBLE. × 51⅔. *c*, FRONTAL LAMINA. × 51⅔.

The first three pairs of legs are prehensile, the last four pairs ambulatory.

ALCIRONA HIRSUTA Moore.

Alcirona hirsuta Moore, Bull. U. S. Fish Comm., XX, Pt. 2, 1902, p. 170, pl. IX, figs. 6–10.

Locality.—Off St. Thomas.
Depth.—20–23 fathoms.
Found in coral bottom.

"Front slightly produced and somewhat inflexed between the bases of the antennules, not joining the epistome; eyes small, lateral, distance between two or three times their diameter. Body strongly arched antero-posteriorly. Epistome narrow, pentagonal. First antennæ with two-jointed peduncle reaching to about end of fourth

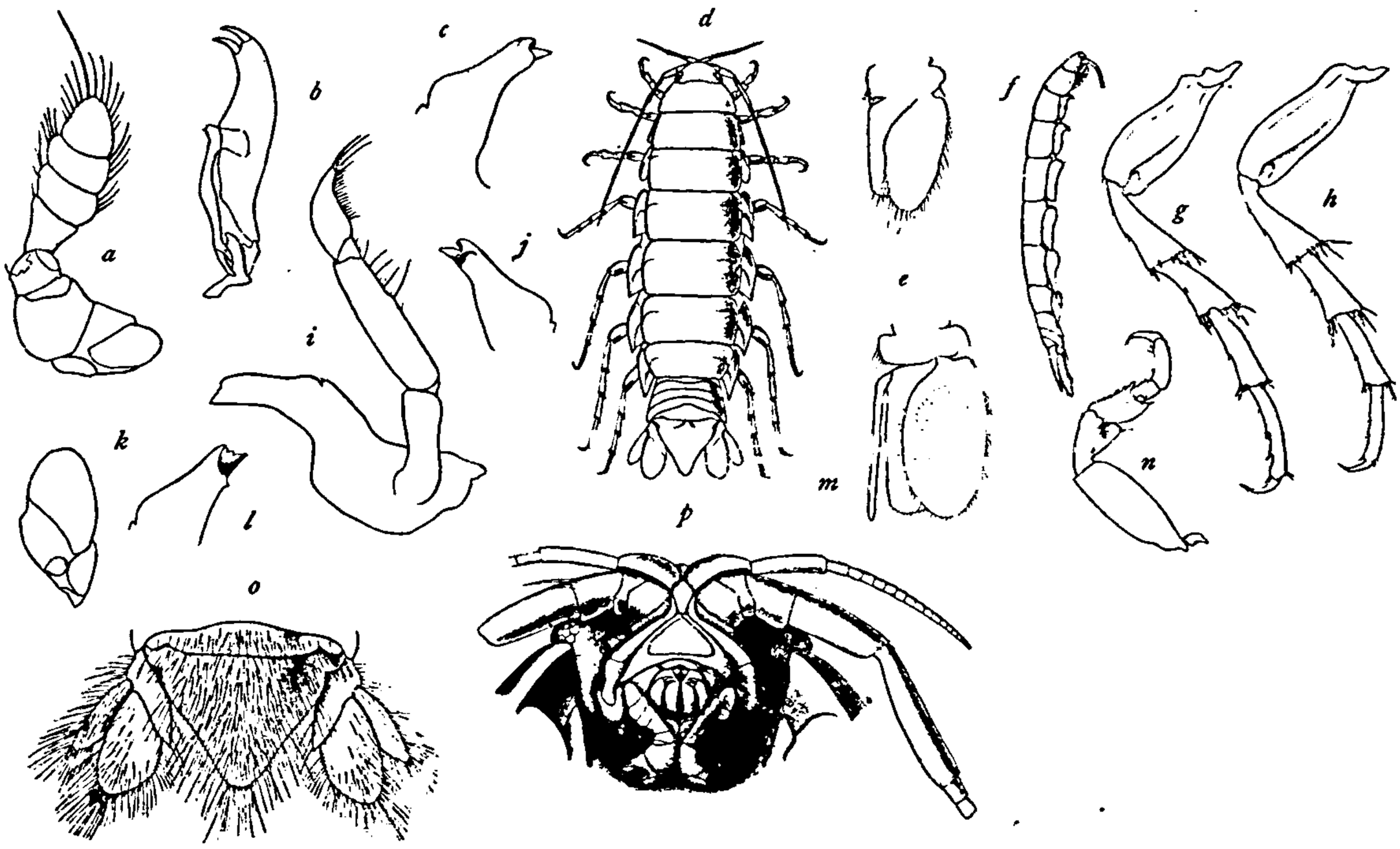

FIG. 139.—ALCIRONA KREBSII (AFTER HANSEN). *a*, MAXILLIPED. *b*, FIRST MAXILLA. *c*, DISTAL PART OF MANDIBLE. *d*, DORSAL VIEW OF FEMALE. *e*, LEFT PLEOPOD OF SECOND PAIR IN YOUNG MALE. *f*, LATERAL VIEW OF FEMALE. *g*, LEG OF FIFTH PAIR. *h*, LEG OF SEVENTH PAIR. *i*, MANDIBLE. *j*, DISTAL PART OF MANDIBLE. *k*, SECOND MAXILLA. *l*, DISTAL PART OF MANDIBLE. *m*, LEFT PLEOPOD OF SECOND PAIR IN ADULT MALE. *n*, LEG OF SECOND PAIR. *o*, POSTERIOR PART OF ABDOMEN (ADULT MALE). *p*, ANTERIOR PART OF HEAD FROM BELOW.

joint of antennal peduncle. Flagellum slightly shorter than peduncle, of seven joints, first joint as long as second and third. Second antennæ reaching to middle of third segment, with five-jointed peduncle; first three joints short, fourth and fifth joints each about twice as long as third and subequal, flagellum with seventeen joints. Mandibular palp rather robust, three-jointed, second joint longest, second and third joints with setæ.

"Maxillipeds with five-jointed rather robust palps.

"First segment of trunk about 1.6 times as long as second, the next five equal, the seventh a little shorter; third segment with a few setæ on lateral portion of posterior margin; fourth, fifth, sixth, and seventh

with complete rows becoming successively more dense posteriorly. In one specimen a very few hairs at side of second segment. First three pairs of peræopods subsimilar, fourth joint broad and armed with several very strong spines, fifth joint very short, almost hidden in the first leg, somewhat longer in the second and still longer in the third. Seventh joint pectinate, with four long spines in the first leg, in the second and third legs these becoming weaker. Claws strong in all.

"Last four legs successively longer and relatively to their length more slender than the first three pairs, heavily armed with numerous brown-tipped spines.

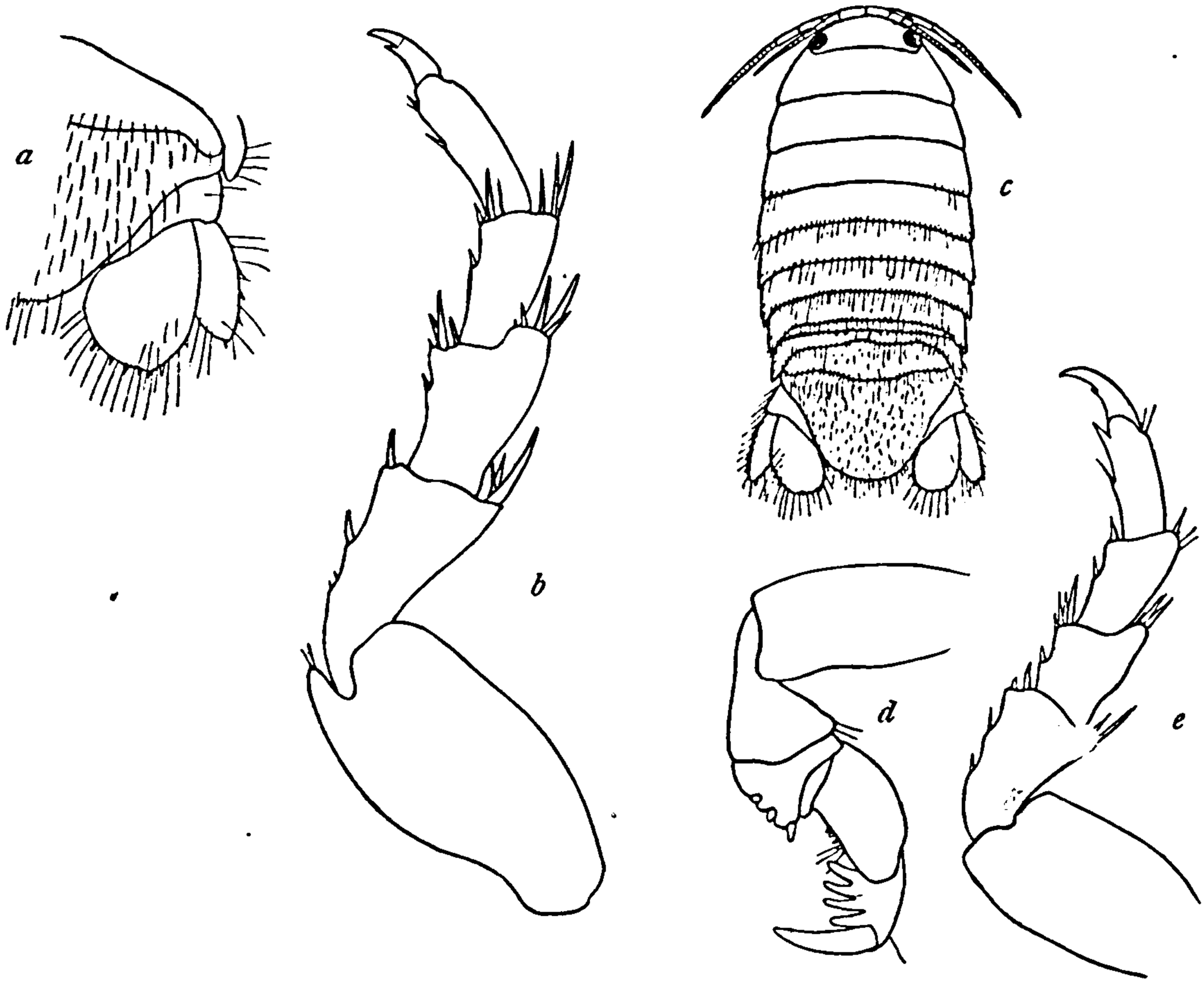

FIG. 140.—ALCIRONA HIRSUTA (AFTER MOORE). *a*, RIGHT SIDE OF TERMINAL ABDOMINAL SEGMENT WITH UROPOD. *b*, SEVENTH LEG. × 40. *c*, GENERAL FIGURE. × 8. *d*, FIRST LEG. × 40. *e*, FOURTH LEG. × 40.

"Pleon of five visible segments, dorsally strongly setose, first and second segments narrow and laterally covered by the seventh thoracic segment, the first being visible only dorsally; third segment posteriorly produced at the sides, covering the lateral portion of the fourth segment, which is the longest in the median line. This region is so setose that it is difficult to delimitate the segments.

"Telson triangular, with the tip rounded and armed with six spines, about two-thirds as long as broad; dorsal surface and posterior margin with numerous setæ. Uropods extending somewhat beyond end of telson, inner branch the longer, not much longer than broad, rounded, with about ten marginal spines and numerous setæ about

half as long as the ramus itself; external ramus narrow, with about eight spines and numerous setæ on the posterior and outer margin.

"This species is close to *A. insularis*, from which it differs in its greater hairiness.

"Two specimens. Station 6079, 20 fathoms, 5 by 2.3 mm."—MOORE.[a]

28. Genus TRIDENTELLA, new genus.

First pair of antennæ with peduncle composed of three articles.

First maxillæ with the apex of the third article furnished with three spines. Second maxillæ indistinctly bilobed at the tip.

Mandibles becoming narrower from the base to the apex; movable lacinia absent; molar part well developed.

Clypeus wide and short, in the form of an inverted v, with the post-lateral angles produced almost to the articulation of the mandibular palp.

Labrum small.

TRIDENTELLA VIRGINIANA (Richardson).

Cirolana virginiana RICHARDSON, American Naturalist, XXXIV, 1900, p. 216; Proc. U. S. Nat. Mus., XXIII, 1901, pp. 512–513.

Locality.—Chesapeake Bay.

Depth.—81 fathoms.

Body not quite twice as long as broad, oval, thickset. Head transverse, with indications of four small tubercles, two on the anterior portion, between the eyes, and two on the posterior portion. Eyes large, lateral. First pair of antennæ long, nearly as long as the second pair, reaching the posterior margin of the first thoracic segment; flagellum twelve-jointed. Second pair of antennæ extend to the middle of the third thoracic segment; flagellum eighteen-jointed.

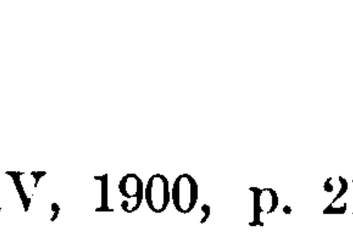

FIG. 141.—TRIDENTELLA VIRGINIANA. FRONTAL LAMINA, CLYPEUS AND LABRUM. (DIAGRAMMATIC.)

First thoracic segment one and a half times longer than any of the other segments. Following segments of equal length.

First abdominal segment almost entirely concealed by last thoracic segment. Four succeeding segments of equal length. Terminal segment very short and narrow, not longer than the four abdominal segments taken together, posteriorly rounded and crenulate. Both branches of the uropoda crenulate. Inner branch broad and equaling in length the terminal segment. Outer branch narrower and a little shorter than inner branch.

Abdomen minutely granulose.

[a] Bull. U. S. Fish Comm., XX, Pt. 2, 1902, p. 170.

Color, light brown.

Two specimens were collected by the U. S. Bureau of Fisheries steamer *Albatross* in Chesapeake Bay.

Type.—Cat. No. 6350, U.S.N.M.

The following description is of two specimens from southern California which I have not been able to separate from the species from the Atlantic coast:

Body oblong-ovate, nearly twice as long as wide, 5 mm.: 9 mm.

Head wider than long, 1½ mm.: 2½ mm., with the anterior margin rounded and produced in a small median point, which meets the anterior margin of the frontal lamina. There is a small tubercle situated at the base of the median point. The eyes are small, round, composite, and placed at the post-lateral angles. There are four tubercles on the dorsal surface of the head between the eyes, two close to the anterior margin and the other two close to the posterior margin, one on either side of the median line in each series.

FIG. 142.—TRIDENTELLA VIRGINIANA. FIRST MAXILLA. × 51¾.

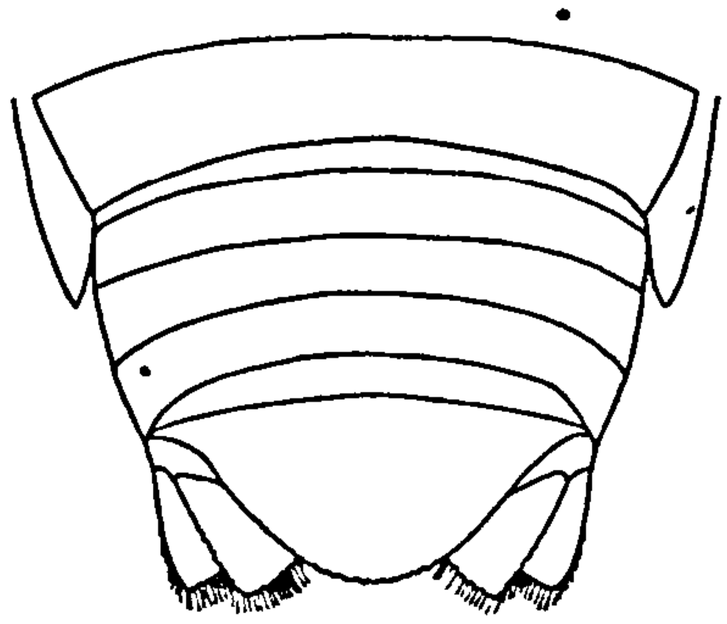

FIG. 143.—TRIDENTELLA VIRGINIANA. ABDOMEN.

The first pair of antennæ have the first two articles short and subequal; the third is about twice as long as the second. The flagellum is composed of twelve articles and extends to the posterior margin of the first thoracic segment. The second pair of antennæ have the first article a little longer than the second and equal in length to the third; the fourth is twice as long as the third; the fifth is a little longer than the fourth. The flagellum is composed of twenty articles and extends to the posterior margin of the third thoracic segment. The maxillipeds are composed of seven articles. The mandible has a palp of three articles. The frontal lamina is short and broad.

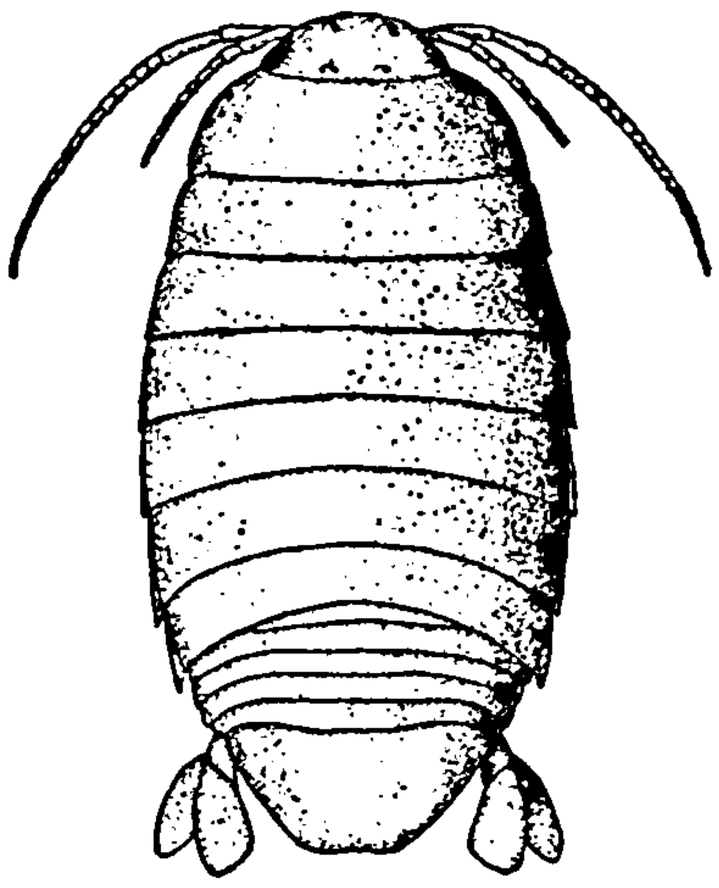

FIG. 144.—TRIDENTELLA VIRGINIANA. × 6.

The first segment of the thorax is twice as long as any of the following segments, which are subequal. The epimera are distinctly separated on all the segments with the exception of the first. The last

four have the outer post-lateral angle acutely produced beyond the posterior margin of the segments.

All six segments of the abdomen are distinct, although the first is partly covered at the sides by the last thoracic segment. The sixth or terminal segment is wider than long, 3 mm.: 2 mm., and is rounded posteriorly with margins distinctly crenulate and has a slight median emargination. The inner branch of the uropoda reaches the extremity of the terminal segment of the abdomen. It is broad and truncate posteriorly, with margins distinctly crenulate and furnished with spines. The outer branch is shorter than the inner branch, is narrower and more pointed at its extremity. It is also distinctly crenulate and furnished with spines.

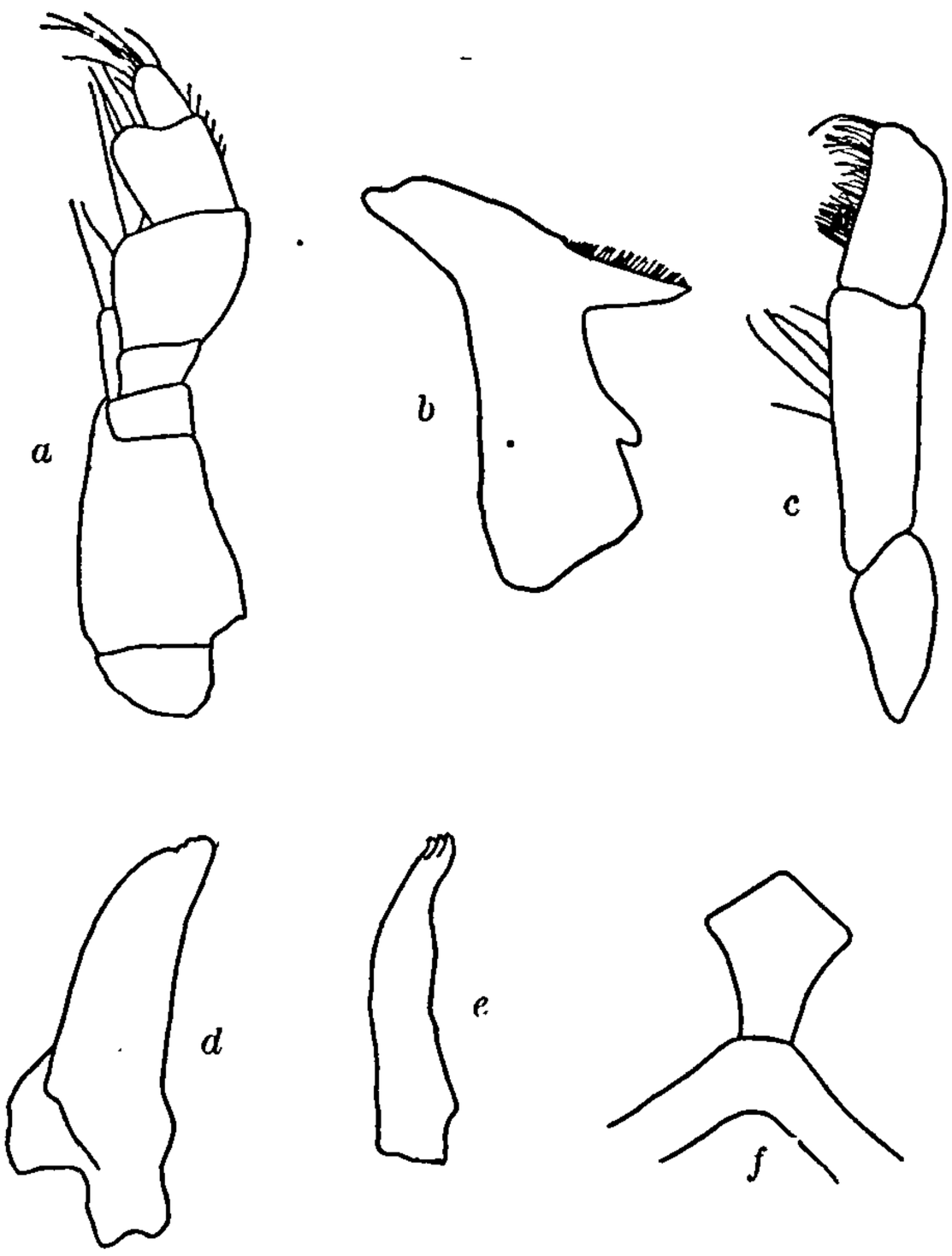

FIG. 145.—TRIDENTELLA VIRGINIANA. *a*, MAXILLIPED. × 51⅔. *b*, MANDIBLE. × 51⅔. *c*, PALP OF MANDIBLE. × 51⅔. *d*, SECOND MAXILLA. *e*, FIRST MAXILLA (OUTER LOBE). × 51⅔. *f*, FRONTAL LAMINA. × 27⅓.

Two specimens of this species were collected by the U. S. Bureau of Fisheries steamer *Albatross* at station 4417, S. W. Rock, Santa Barbara Islands, latitude 8° north, longitude, 6.3′ west.

Depth.—29 fathoms.

29. Genus NALICORA Moore.

"Clypeus small, peduncle of second antennæ long; mandible weak, with bidentate cutting edge and three-jointed palp; first maxillæ very large, robust, and conspicuous in situ, outer joint stout, hooked, and terminated by a strong, curved spine in the male, continuous in contour with the rest of the part, and with a knob-like process at its base; inner joint with its tip covered by a quadrate, curve-faced cap covered with papillæ; second maxillæ four-jointed, first two joints stout, short, third joint stout and subconical, terminal joint slender and conical, with a tuft of setæ near tip; palp of maxillipeds five-jointed, slender."—MOORE.[a]

[a] Bull. U. S. Fish Commission, XX, Pt. 2, 1902, p. 169.

NALICORA RAPAX Moore.

Nalicora rapax Moore, Bull. U. S. Fish Commission, XX, Pt. 2, 1902, pp. 169–170, pl. IX, figs. 11–22.

Localities.—Mayaguez Harbor, Porto Rico; Gulf of Mexico; latitude 29° 11′ 30″ north, longitude 85° 29′ west; latitude 28° 46′ north, longitude 84° 49′ west; latitude 29° 16′ 30″ north, longitude 85° 32′ west; between delta of the Mississippi and Cedar Keys, Florida.

Depth.—25–75 fathoms.

"Body convex, about 2.3 times as long as broad, first thoracic segment longest, next five about two-thirds as long and subequal, last shorter; posterior four thoracic segments with a row of setæ across middle and another on posterior margin, hairiness increasing posteriorly, occasionally a few setæ on second and third. Fifth segment broadest.

"Pleon and telson about two-fifths as long as rest of body. Pleon of four visible segments, first short and narrower than second and third and hidden at side by seventh thoracic; second somewhat produced at posterior lateral angle; third segment strongly produced, angle reaching to beyond base of uropods.

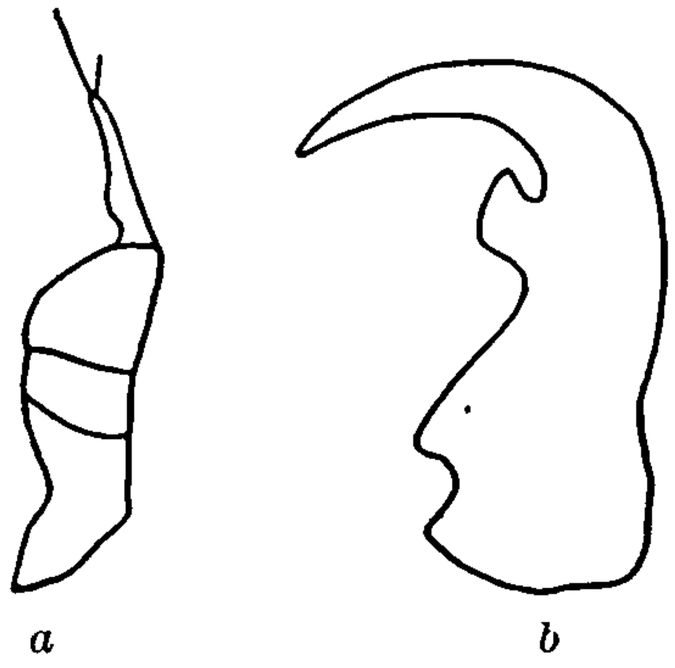

FIG. 146.—NALICORA RAPAX. *a*, SECOND MAXILLA. × 51⅔. *b*, OUTER LOBE OF FIRST MAXILLA. × 51⅔.

"Epimera of all the thoracic segments except the first distinct, of second and third not produced posteriorly, the following ones successively more produced, the last two terminating in strong angles.

"First antennæ about as long as peduncle of second antennæ; peduncle of two equal joints, flagellum slightly longer than peduncle, about eight or nine jointed; distal ends of segments furnished with a few short hairs; second antennæ reaching to end of second thoracic segment; peduncle five-jointed, fifth joint longest, slightly exceeding the fourth, which is as long as first three joints together.

"Mandible weak, with bifid cutting edge and three-jointed palp. First maxilla large, robust; plate of first joint expanded at distal end into a somewhat quadrate curved face closely beset with papillæ and looking like a triturating plate; third joint very stout, strongly curved with a very strong terminal spine continuous in contour with the rest of the joint; at base of curved portion, on inner side, a stout knob-like protuberance. The first maxilla is the largest and most conspicuous of the mouth parts, overlapping and hiding the mandible, and in the male reaching to the base of the antennæ. In the female the terminal spine is straighter, not so continuous with the rest of the plate, and points inward and somewhat backward. Second maxilla four-

jointed; first two joints short and stout; second joint stout, decreasing distally; third joint slender and tapering, set at an angle to second joint and furnished at its tip with several setæ, one of which is usually longer and stouter than the others. Maxillipeds with rather slender five-jointed palp, more slender in male, first joint shortest, second joint longest, two to three times as long as first.

"First pair of thoracic limbs with fifth joint set obliquely to the plane of the preceding joints, very short, almost hidden on inner or anterior face, but triangular and appearing to be deeply embedded in

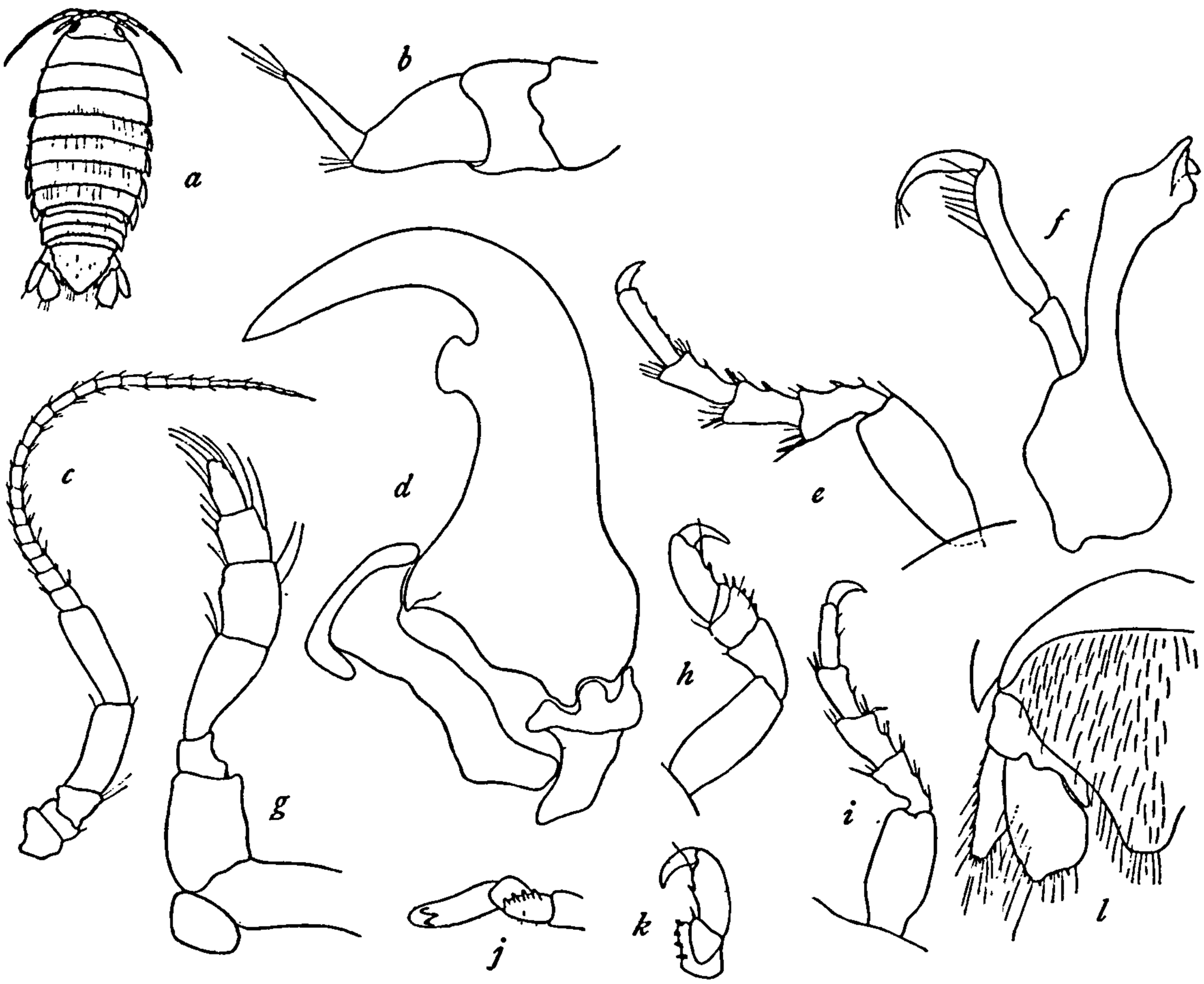

FIG. 147.—NALICORA RAPAX (AFTER MOORE). *a*, GENERAL FIGURE. *b*, SECOND MAXILLA. *c*, SECOND ANTENNA. *d*, FIRST MAXILLA. *e*, SEVENTH LEG. *f*, MANDIBLE. *g*, MAXILLIPED. *h*, FIRST LEG (POSTERIOR). *i*, FOURTH LEG. *j*, FIRST LEG (ANTERIOR). *k*, FIRST LEG (INFERIOR). *l*, PART OF TERMINAL SEGMENT OF ABDOMEN WITH UROPODA.

fourth joint when viewed externally; fourth joint with about four stout spines on inferior edge, second limb with fifth joint longer and with slight obliquity; third pair similar but longer. Pairs four to seven more slender, with numerous spines, the third, fourth, fifth, and sixth joints subequal.

"Uropods stout, the peduncle prolonged at its inner angle into a robust process. Inner ramus broad (about 1.5 times as long as broad), extending beyond end of telson; outer ramus shorter and narrower, extending barely beyond tip of telson; apex truncate or subbifid.

"Telson triangular, about two-thirds as long as broad, lateral margins somewhat excavated, apex narrow, rounded.

"Seventeen specimens from stations 6062 and 6063, 25 to 75 fathoms. Largest 8.5 mm. by 3.8 mm.; smallest 5.5 mm. by 2.5 mm."—MOORE.[a]

Family VIII. ÆGIDÆ.

Body more or less broad, flattened.

Head transverse.

Segments of thorax with epimera distinctly defined on all the segments, with the exception of the first.

Abdomen composed of six well-defined segments, the last segment ciliated on the posterior margin. Uropoda together with the terminal abdominal segment forming a caudal fan. Eyes, when present, usually large. Antennæ laterally directed, both pairs furnished with distinctly defined, multi-articulate flagella. Peduncle and flagella well defined.

First three pairs of legs prehensile, last four pairs ambulatory.

Pleopods serving for swimming and for respiration; furnished with cilia.

First maxillæ with only a single slender masticatory lobe, tipped by short spines.

Second maxillæ broader, terminating in two unequal lobes, armed with recurved teeth.

Last article of palp of maxillipeds armed with strong recurved teeth.

Terminal abdominal segment and uropoda furnished with cilia.

Parasitic forms usually found attached to the skin of fishes.

ANALYTICAL KEY TO THE GENERA OF THE FAMILY ÆGIDÆ.

a. Body compact. First two articles of the peduncle of the first pair of antennæ more or less expanded. Frontal lamina large. Maxillipeds with the palp composed of five articles. Front of head with median point separating wholly or partly the first articles of the first pair of antennæ. Flagellum of the first antennæ composed of numerous articles. Abdomen compact.....Genus *Ega* Leach

a'. Body depressed. First two articles of the peduncle of the first pair of antennæ not expanded. Frontal lamina small. Maxillipeds with the palp composed of only two articles. Front of head covering more or less the peduncle of the first pair of antennæ. Flagellum of first antennæ composed of four to six articles. Abdomen relaxed.

b. Eyes present. Three anterior pairs of legs with propodus more or less expanded, and armed with spines; dactylus forming a very large and evenly curved hook. Four posterior pairs with the propodus short. Mandibles with the cutting edge expanded inside in a linguiform lamella. Abdomen not much narrower than thorax.....Genus *Rocinela* Leach

b'. Eyes wanting. Three anterior pairs of legs with propodus not expanded; dactylus abruptly curved in the middle and terminating in a very sharp point. Four posterior pairs with the propodus elongated. Mandibles without linguiform lamella. Abdomen abruptly narrower than thorax..Genus *Syscenus* Harger

[a] Bull. U. S. Fish Commission, XX, Pt. 2, 1902, pp. 169–170.

30. Genus ÆGA Leach.

Body rather compact. Abdomen not much narrower than thorax.

Eyes present, usually large, often contiguous.

First two articles of the peduncle of the first pair of antennæ more or less expanded, dilated. Frontal lamina or epistome large.

Mandibles without molar expansion. Palp of maxillipeds composed of five articles.[a]

Three anterior pairs of legs with the propodus simple, cylindrical, not expanded; dactylus abruptly curved in the middle. Four posterior pairs with the propodus short.

ANALYTICAL KEY TO THE SPECIES OF THE GENUS ÆGA.

a. First pair of antennæ with the first two articles of the peduncle very much enlarged, dilated, flattened. The second article is produced at the upper distal angle in a process which extends half the length of the third article. The third article is half as wide as the second article, or narrower. Frontal lamina plane or concave.

b. Terminal segment of abdomen pointed posteriorly, triangulate.

c. Eyes distant ..... *Æga psora* (Linnæus)

c′. Eyes contiguous ..... *Æga antillensis* Schiœdte and Meinert

b′. Terminal segment of abdomen not pointed posteriorly or triangulate.

c. Terminal segment bisinuate, forming three obtuse teeth on the posterior margin ..... *Æga ecarinata* Richardson

c′. Terminal segment of abdomen posteriorly emarginate or truncate.

d. Eyes contiguous ..... *Æga crenulata* Lütken

d′. Eyes distant.

e. Propodus of second and third pairs of legs furnished at distal end on inferior margin with linguiform process ..... *Æga webbii* (Guérin)

e′. Propodus of second and third pairs of legs not furnished at distal end on inferior margin with linguiform process ..... *Æga lecontii* (Dana)

a′. Peduncle of the first pair of antennæ with the first two articles not enlarged or dilated, but compressed and rounded. The second article is not produced at the upper distal angle in a process which extends half the length of the third article. Third article not narrower than second article. Frontal lamina convex or compressed and elevated.

b. Eyes contiguous.

c. Terminal segment of abdomen whole, entire.

Æga tenuipes Schiœdte and Meinert

c′. Terminal segment of abdomen not whole or entire.

d. Terminal segment of abdomen terminating in seven teeth in the middle.

Æga dentata Schiœdte and Meinert

d′. Terminal segment of abdomen with small rounded incision or emargination at the apex ..... *Æga incisa* Schiœdte and Meinert

b′. Eyes not contiguous.

c. Terminal segment of abdomen with small, round median notch or emargination ..... *Æga arctica* Lütken

c′. Terminal segment of abdomen without median notch or emargination.

d. Eyes very large.

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[a] In drawing the maxillipeds of the various species it was not always possible to place the maxilliped in a position to show all five articles of the palp or to represent the dividing line between the last two articles.

e. All legs free of spines.....*Ega gracilipes* Hansen
e'. Legs furnished with spines.
f. Uropoda extend beyond the tip of the abdomen.
Ega symmetrica Richardson
f'. Uropoda, do not extend beyond the tip of the abdomen.
Ega ventrosa M. Sars
d'. Eyes very small.....*Ega microphthalma* Dana

ÆGA PSORA (Linnæus).

Oniscus psora Linnæus, Fauna suecica, 2d ed., 1761, p. 499, No. 2054; Syst. Nat., 12th ed., I, 1767, p. 1060.—O. Fabricius, Fauna Grœnlandica, 1780, p. 249.
Ægа emarginata Leach, Trans. Linn. Soc. London, XI, 1815, p. 370; Dict. Sci. Nat., XII, 1818, p. 349.—Desmarest, Consid. Crust., 1825, p. 305, pl. xlvii, figs. 4–5.
Ægа entaillée Latreille, Règne Anim., IV, 1829, p. 134.
Ægа emarginata Gould, Rept. Geol. Mass., 1835, p. 549.
Ægа (*Oniscus psora*) Krøyer, Dansk. Vid. Selsk. Afh., VII, 1838, p. 318.
Ægа emarginata Milne Edwards, Hist. Nat. Crust., III, 1840, p. 240.—Gould, Invert. Mass., 1841, p. 338.—Milne Edwards, Règne Anim. Crust., 1849, pl. iv, fig. 4; pl. lxvii, fig. 1.
Ægа psora Lilljeborg, Öfvers. Vet.-Acad. Förh., VII, 1850, p. 84; VIII, 1851, p. 24.—Lütken, Vidensk. Meddel., 1859, pp. 65, 179; 1861, p. 181 (7).—Schiœdte, Ann. Mag. Nat. Hist. (4), I, 1868, p. 12.—Bate and Westwood, British Sessile-eyed Crustacea, II, 1868, p. 283.—M. Sars, Chr. Vid.-Selsk. Förh., 1869, p. 261.—G. O. Sars, Chr. Vid.-Selsk. Förh., 1872, p. 275 (32).—Verrill, Am. Jour. Sci. (3), V, 1873, p. 16.—Smith and Harger, Trans. Conn. Acad. Sci., III, 1874, p. 22.—Lütken, Crustacea of Greenland, 1875, p. 150.—Meinert, Naturh. Tidsskr. (3), XI, 1877, p. 89.—Miers, Ann. Mag. Nat. Hist. (4), XIX, 1877, p. 134.—Harger, Proc. U. S. Nat. Mus., II, 1879, p. 161; Report U. S. Commissioner of Fish and Fisheries, Pt. 6, 1880, pp. 384–387, pl. x, fig. 64 (see Harger for synomyiny).—Schiœdte and Meinert, Nat. Tidsskr. (3), XII, 1879–80, pp. 357–360, pl. viii, figs. 5–6.—Miers, Journ. Linn. Soc. London, Zool., XV, 1881, pp. 65–66.—Hansen, Videnskabelige Meddelelser fra den naturhistoriske Forening i Kjøbenhavn, 1887–1888, p. 183.—Sars, Crust. of Norway, II, 1899, p. 59, pl. xxiv.—Richardson, American Naturalist, XXXIV, 1900, p. 218; Proc. U. S. Nat. Mus., XXIII, 1901, p. 521.—Axel Ohlin, Bihang till K. Svenska Vet.-Akad. Handl., XXVI, Afd. iv, 1901, pp. 22–23.

Localities.—Off Marthas Vineyard; Georges Bank; Browns Bank; Fishers Island Sound; La Have Bank; Gulf of Maine; Western Bank; Gloucester; Sable Island Bank; between Peters Bank and Banquereau; Nova Scotia; Grand Bank; Newfoundland; Gulf of St. Lawrence; Nakvak, Labrador; Holstensborg, Nanortalik, Ivigtut, Julianehaab, Arsukfjord, Godhavn, Egedesminde, Ikerasak, and Umanek, Greenland; North Greenland in Davis Straits; Hudsons Bay; also Ireland; British Isles; North Sea; Finmark; Iceland; Bjonens Bay; Spitzbergen; in the German Sea; Kattegat; between the delta of the Mississippi and Cedar Keys, Florida; latitude 43° 34′ north, longitude 49° west; latitude 43° 25′ north, longitude 59° 50′ west; latitude 42° 47′ north; longitude 65° 30′ west.

Depth.—30–640 fathoms.

Parasites of skate, cod, and halibut; on *Gadus ogac;* on *Myxocephalus scorpius;* on *Somniosus microcephalus;* on *Gadus callarias.*

Body ovate, a little more than one and a half times longer than broad, 10 mm : 16 mm.

Head two and a half times broader than long, 2 mm : 5 mm. Anterior margin widely rounded, and produced in a small median point, which does not arch over the antennæ to meet the frontal lamina on the other side. Eyes large, oval, composite, occupying a large part of the dorsal surface of the head, but not contiguous, although very close together. The first pair of antennæ have the first two articles very much enlarged; the first article is wider and longer than the second; the second is produced at the upper distal angle in a process which extends half the length of the third article; the third article is very narrow, half as wide as the second article. The flagellum is composed of fourteen articles. The first antennæ extend to the end of the peduncle of the second pair of antennæ. The first three articles of the second antennæ are subequal; the fourth and fifth are about equal in length, and each twice as long as the third. The flagellum is composed of fifteen articles. The second pair of antennæ extend a little beyond the posterior margin of the first thoracic segment. The frontal lamina is large, with base somewhat quadrate in shape, with rounded angles, and ventrally placed, not directed anteriorly. The maxilliped has a palp of five articles.

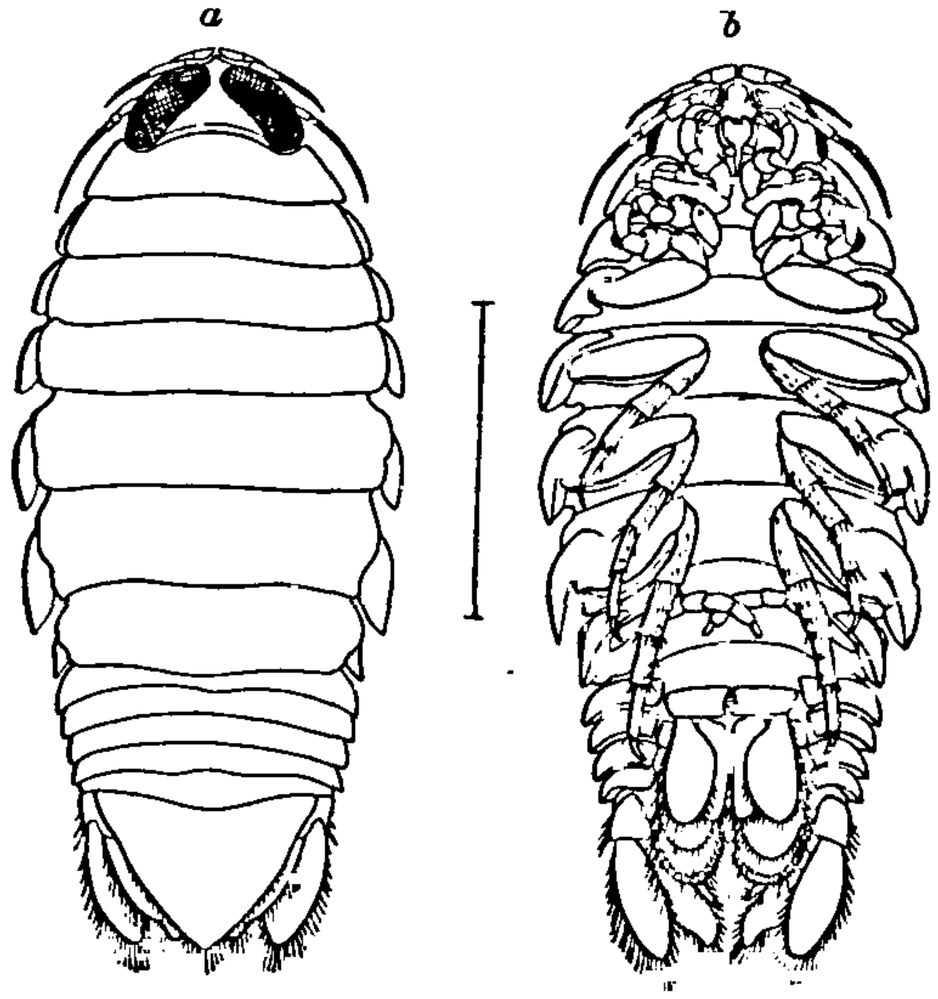

FIG. 148.—ÆGA'PSORA (AFTER HARGER). × 3.
a, Ventral view. *b*, Dorsal view.

The first three segments of the thorax are longer than the three following. The seventh is very short, being only less than half as wide as the sixth. The epimera of all the segments are distinct with the exception of the first. They are narrow plates with the posterior angles produced in the last four, although in the epimeron of the fourth segment, the posterior angle is rounded. On all the epimera there is a faint carina extending obliquely across the surface.

All six segments of the abdomen are distinct. The first is completely covered in the middle by the seventh thoracic segment but is visible at the sides. The lateral parts of the segments are not separated off from the dorsal portion. The sixth or terminal segment is triangulate, with apex not produced. The branches of the uropoda do not extend beyond the tip of the terminal abdominal segment. The basal segment extends two-thirds the length of the sixth abdominal segment. The branches are about equal in length, the outer one being

only a very little shorter than the inner one. The exterior margin of the inner branch has a small notch or excavation about 1 mm. from the extremity. The inner branch is obliquely truncate at the extremity, the inner angle being obtusely rounded, the outer one more acute. The outer branch is rounded posteriorly.

The first three pairs of legs are prehensile, the last four pairs ambulatory. The second and third pairs have the carpus furnished with eight spines, the merus with two. The last four pairs of legs are also furnished with spines.[a]

ÆGA ANTILLENSIS Schiœdte and Meinert.

Æga antillensis SCHIŒDTE and MEINERT, Naturhistorisk Tidsskrift (3), XII, 1879–80, pp. 361–362, pl. VIII, figs. 10–13.—RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 521.

Localities.—Cuba, West Indies, off Cozumel; off Habana.

Depth.—163–231 fathoms.

Body oblong-ovate, about three times as long as broad, 12 mm.: 35 mm.

Head a little over three times as wide as long, 2 mm.: 7 mm. Anterior margin widely rounded with a small median process which does not arch over the antennæ to meet the frontal lamina on the other side. Eyes large, oblong, composite, occupying almost the entire surface of the head and extending from the lateral angles along the anterior margin and meeting or contiguous in the median line. The basal article of the first antennæ is about twice as long as the second; the first and third are subequal, but the third is narrower, the first and second being dilated. The flagellum is composed of seven articles. The first antennæ extend only to the middle of the fifth article of the peduncle of the second antennæ and do not reach the anterior margin of the first thoracic segment. The first two articles of the second pair of antennæ are equal in length; the third is about twice as long as the second; the fourth is one and a half times longer than the third; the fifth is but little longer than the fourth. The flagellum is composed of thirteen articles and reaches two-thirds the length of the first thoracic segment. The maxilliped has a palp of

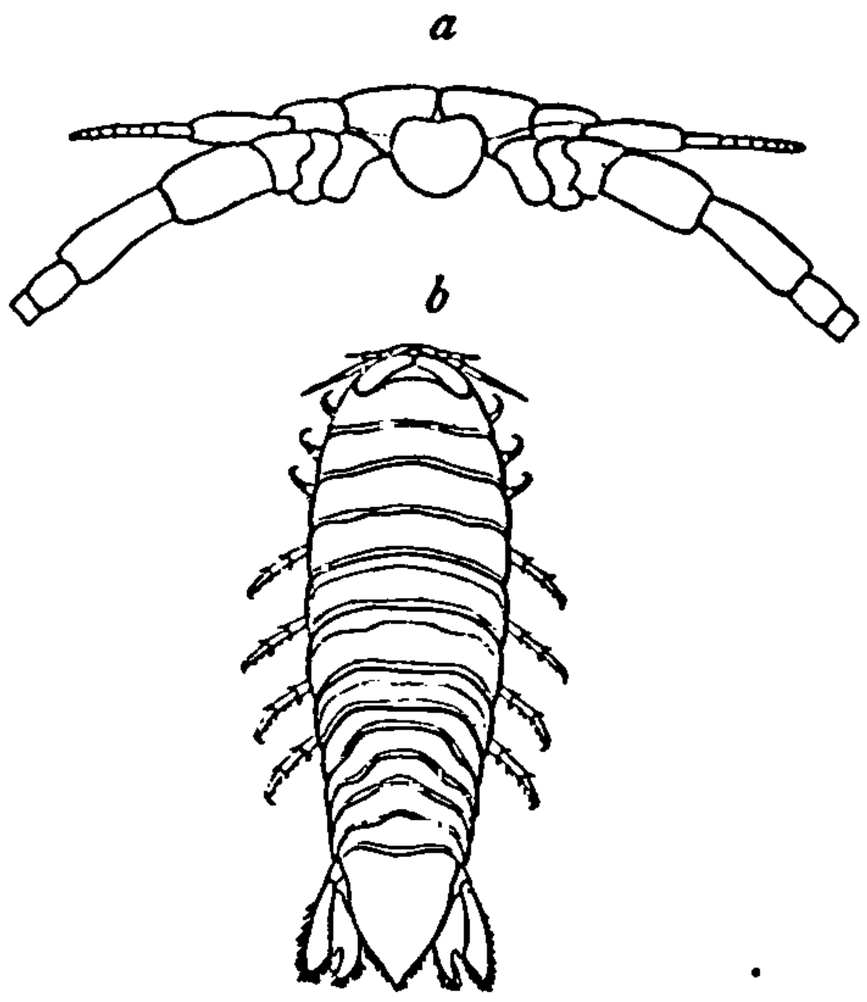

FIG. 149.—ÆGA ANTILLENSIS (AFTER SCHIŒDTE AND MEINERT). *a*, FRONTAL MARGIN WITH BOTH ANTENNÆ AND FRONTAL LAMINA. *b*, YOUNG FEMALE. (ENLARGED.)

[a] For description of the young of the third stage, see Schiœdte and Meinert, Nat. Tidsskr. (3), XII, 1879–80, pp. 358–359.

five articles. The frontal lamina has the large round disk of the base ventrally placed, not anteriorly directed.

The first segment of the thorax is a little longer than any of the others, and the seventh is shorter. The epimera of all the segments, from the second to the seventh, inclusive, are distinctly separated from the segment. They are narrow, with the posterior angle in the last four acutely produced beyond the posterior margin of the segments. The first two epimera are rounded posteriorly. A distinct carina extends obliquely from the posterior angle to the inner antero-lateral angle in all the epimera.

The six abdominal segments are all distinct. The lateral parts are not separated off from the dorsal portion. The sixth or terminal segment is triangularly produced in a long and very acute point, extending 2 mm. beyond the extremity of the uropoda. The branches of the uropoda are equal in length. The inner branch has a conspicuous notch or emargination on the exterior margin about 2 mm. from the posterior extremity which is acutely produced. The outer branch is about as wide as the inner branch, the margins are entire, and the posterior extremity rounded. The branches of the uropoda are crenulate and furnished with spines. The basal article or peduncle extends half the length of the last segment of the abdomen.

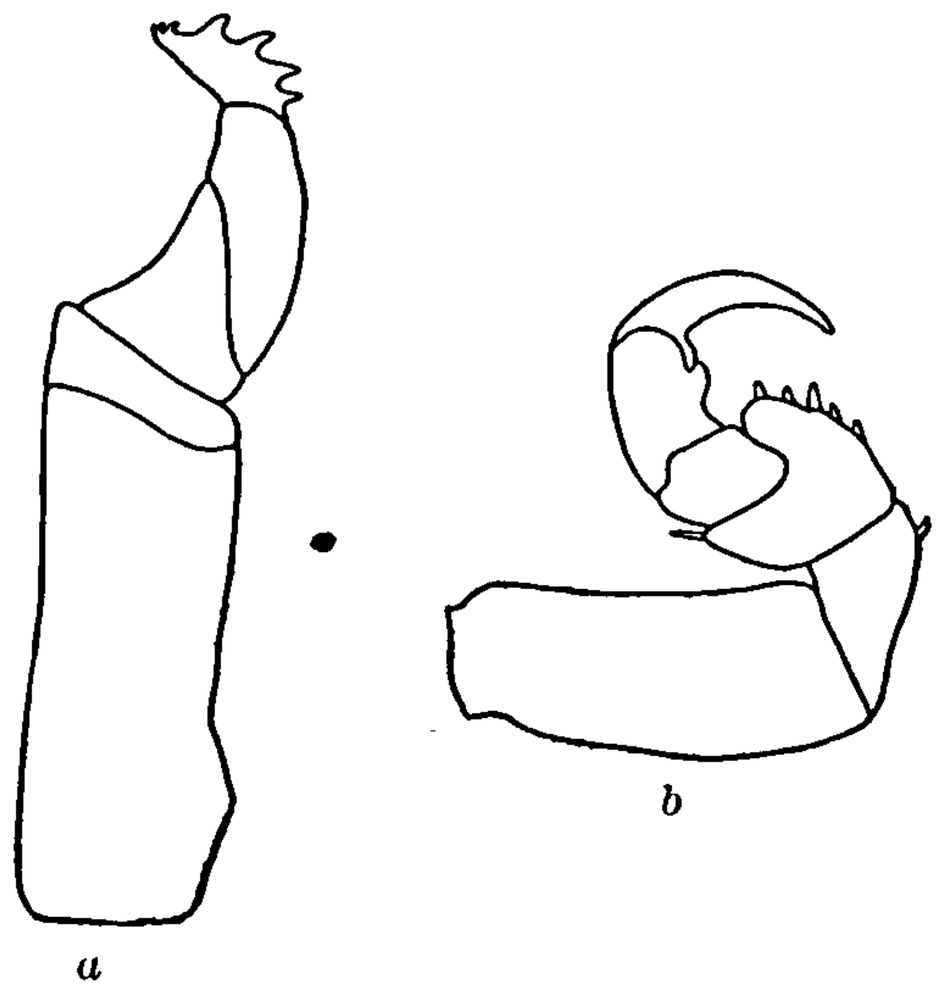

FIG. 150.—ÆGA ANTILLENSIS. *a*, MAXILLIPED. × 27⅓. *b*, LEG OF SECOND PAIR. × 9⅓.

The first three pairs of legs are prehensile, the last four pairs ambulatory. There are five spines on the merus of the second and third pairs of legs. The last four pairs of legs are thickly beset with spines.

ÆGA ECARINATA Richardson.

Æga ecarinata RICHARDSON, Proc. Biol. Soc. Washington, XII, 1898, pp. 39–40; American Naturalist, XXXIV, 1900, p. 218; Proc. U. S. Nat. Mus., XXIII, 1901, p. 521.—MOORE, Bull. U. S. Fish Comm., XX, Pt. 2, 1902, p. 171, pl. x, fig. 1.

Localities.—Off Little Bahama Bank, between delta of the Mississippi and Cedar Keys, Florida; off entrance to San Juan.

Depth.—88–338 fathoms.

Body elongate and narrow. Length more than three times greater than breadth. Surface punctate. Frontal margin of head bisinuated, the acumen separating the first pair of antennæ. Eyes large and oblong and situated a small distance apart. First pair of antennæ

extend almost to the flagellum of the second pair of antennæ; the first two joints of the peduncle very broad; second joint extends anteriorly over the third joint, reaching almost to the extremity of that joint; third joint two-thirds narrower than first and second; the flagellum is composed of nine articles. Second pair of antennæ extend to the middle of the first thoracic segment; flagellum is composed of ten articles.

Epimera of all the thoracic segments narrow, the first two being rounded, the other four more acute at their extremities. First two pairs of prehensile legs rather stout; third pair less so, and the propodus of this pair is furnished with a large cultriform process. Five spines are present on the merus of all three pairs. Gressorial legs slender and sparsely spinulose.

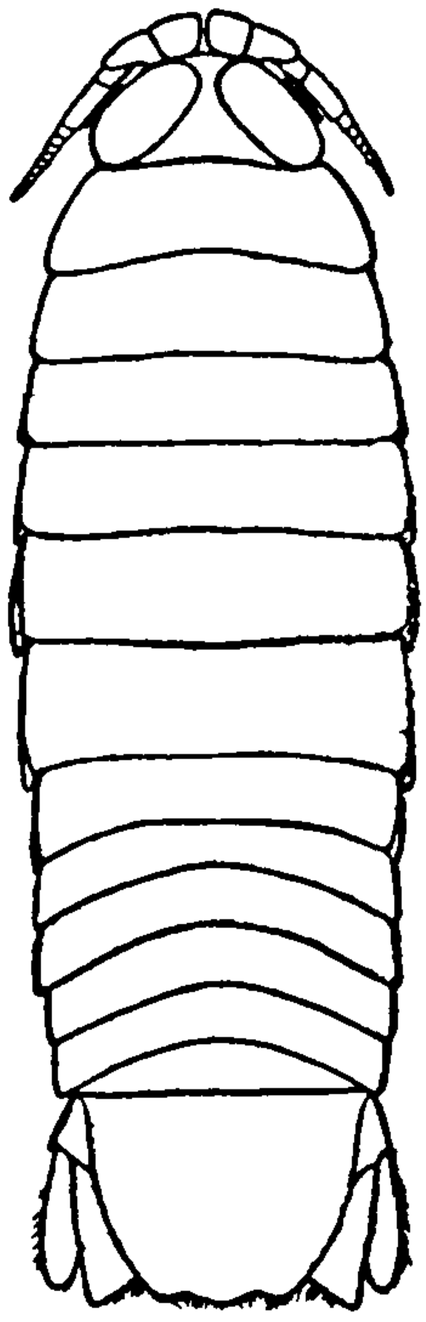

FIG. 151.—ÆGA ECARINATA. ×2⅝.

All the abdominal segments are visible in a dorsal view. Terminal segment broad and posteriorly bisinuated, forming three teeth with rounded extremities; its surface is entirely smooth.

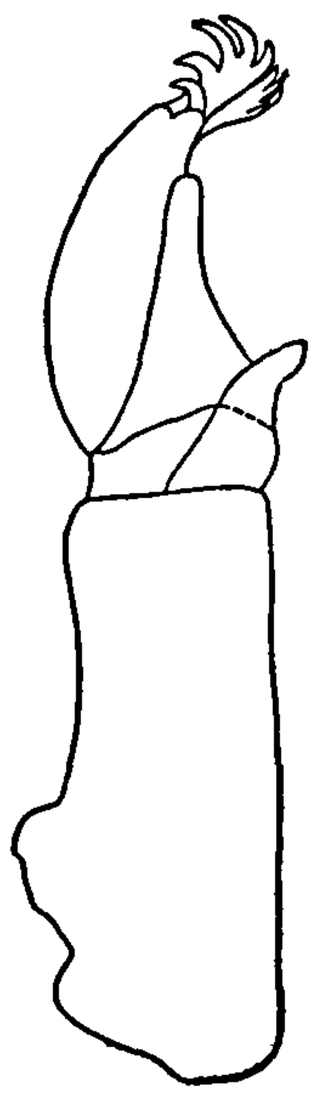

FIG. 152.—ÆGA ECARINATA. MAXILLIPED. × 39.

Outer branch of uropods narrower and somewhat shorter than the inner branch; its extremity is rounded. Inner branch obliquely truncate and crenulate on posterior margin. Uropods and terminal abdominal segment all fringed with a few hairs.

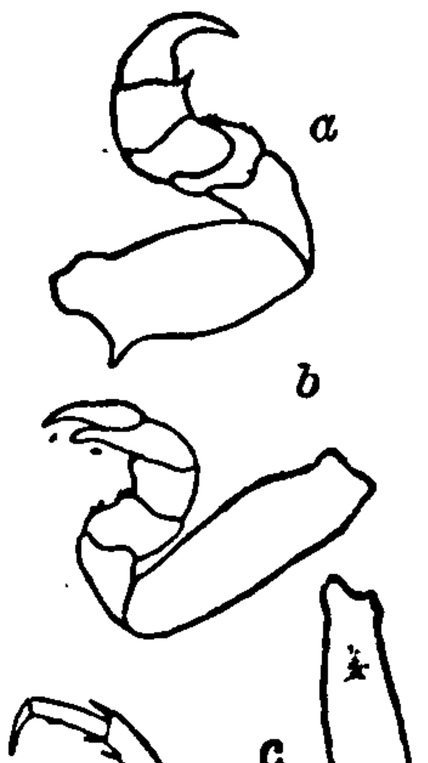

FIG. 153.—ÆGA ECARINATA. × 5⅜. *a*, LEG OF FIRST PAIR. *b*, LEG OF THIRD PAIR. *c*, LEG OF SEVENTH PAIR.

Two individuals of this species were found—one between the delta of the Mississippi and Cedar Keys, Florida, Station 2403, depth 88 fathoms; the other, the type (Cat. No. 21001, U.S.N.M.), off Little Bahama Bank, Station 2655, depth 338 fathoms.

This species is closely related to *A. tridens*[a] Leach, but presents many specific differences; in the relative length and breadth of the body, the length being more than three times greater

[a] For synonymy, see Naturhistorisk Tidsskrift, XII, 1879–80, Schiœdte and Meinert, Symbolæ ad Monographium Cymothoarum, Crustaceorum Isopodum Familiæ, pp. 340–341.

than the breadth in *A. ecarinata*, while in *A. tridens* Leach the length is only two and one-half times greater than the breadth; in the number of joints in the first and second pairs of antennæ, ten in the first pair and nineteen in the second pair being characteristic of *A. tridens* Leach, nine in the first and ten in the second pair being true of our species; in the presence of a cultriform process on the propodus of the third pair of prehensile legs, which process is entirely wanting in *A. tridens* Leach; and in the perfectly smooth surface in the present species of the terminal segment of the abdomen, which in the other species is tricarinated.

ÆGA CRENULATA Lütken.

Æga crenulata Lütken, Vid. Medd. Naturh. Foren. i Kjøbenhavn, 1859, p. 70, pl. A, figs. 4–5.—Schiœdte and Meinert, Naturh. Tidsskrift (3), XII, 1879–80, p. 343, pl. vii, figs. 6–9.—Miers, Journ. Linn. Soc. London, XV, 1881, p. 65.—Hansen, Vid. Medd. Naturh. Foren. i Kjøbenhavn, 1887, p. 183.—Richardson, American Naturalist, XXXIV, 1900, p. 218; Proc. U. S. Nat. Mus., XXIII, 1901, p. 521.—Norman, Ann. Mag. Nat. Hist. (7), XIV, 1904, p. 434.

Localities.—Ritenbenk and Umanek, West Greenland; also Iceland, Finmark, and coast of Norway; in the German Sea.

Parasite of Greenland shark; *Somniosus microcephalus.*

Body oblong-ovate, a little more than twice as long as broad, 13 mm.: 28 mm.

Head a little more than twice as wide as long, 3 mm.: 7 mm. Anterior margin widely rounded and produced in a small median point, which does not arch over the antennæ to meet the frontal lamina on the other side. Eyes large, oval, composite, and occupying almost all the dorsal surface of the head, extending from the lateral angles, along the anterior margin and meeting in the median line, being contiguous. The first antennæ have the two basal articles of the peduncle very much enlarged; the first article is longer and a little wider than the second; the second has a process at the anterior angle of the distal extremity, extending half the length of the third article; the third article is short and narrow, being one-third as wide as the basal article. The flagellum is composed of nine articles. The first antennæ extend to the end of the peduncle of the second pair of antennæ, but not quite to the antero-lateral angles of the first thoracic segment. The first three articles of the second antennæ are subequal; the fourth

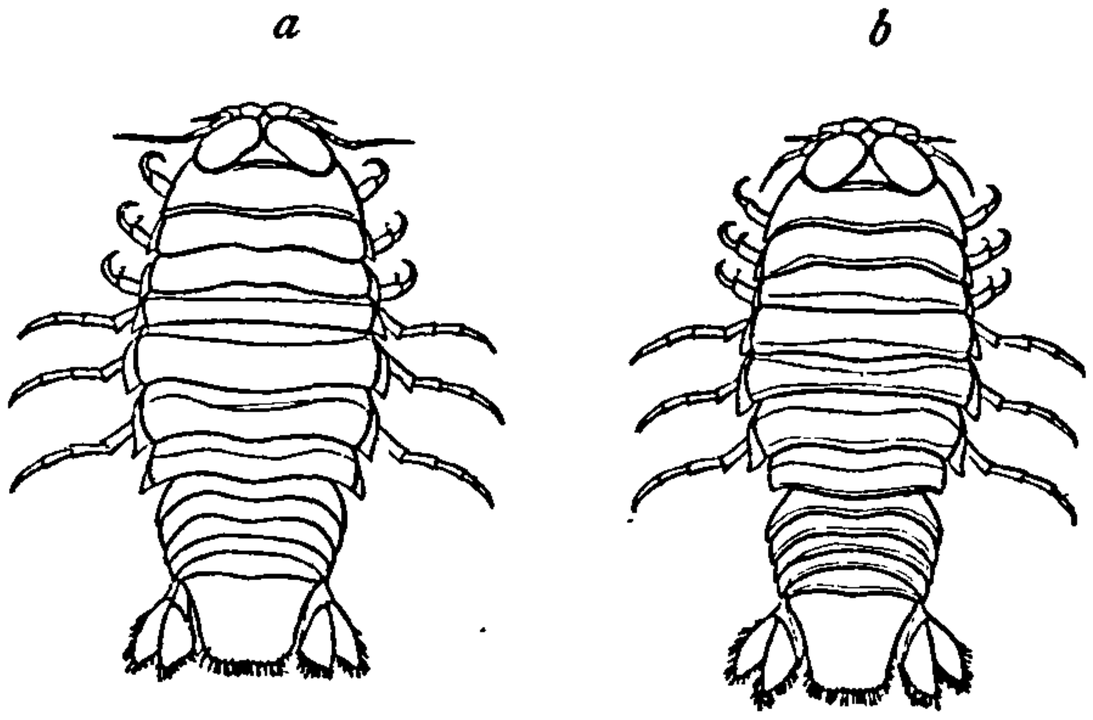

Fig. 154.—Æga crenulata (after Schiœdte and Meinert). *a*, Young of third stage. *b*, Young of second stage. (Both enlarged.)

article is about twice as long as the third; the fifth is a little longer than the fourth. The flagellum is composed of sixteen articles. The second antennæ extend almost to the posterior margin of the first thoracic segment. The frontal lamina is round in outline at the base, which is ventrally situated, not directed anteriorly. The maxilliped has a palp of five articles.

The first, fourth, fifth, and sixth segments of the thorax are longer than the others. The epimera are distinct on all the segments with the exception of the first. They are narrow plates with the post-lateral angles acute. A distinct carina extends obliquely from the post-lateral angle to the middle of the side adjacent to the segment in the last three epimera and to the inner antero-lateral angle in the first three epimera.

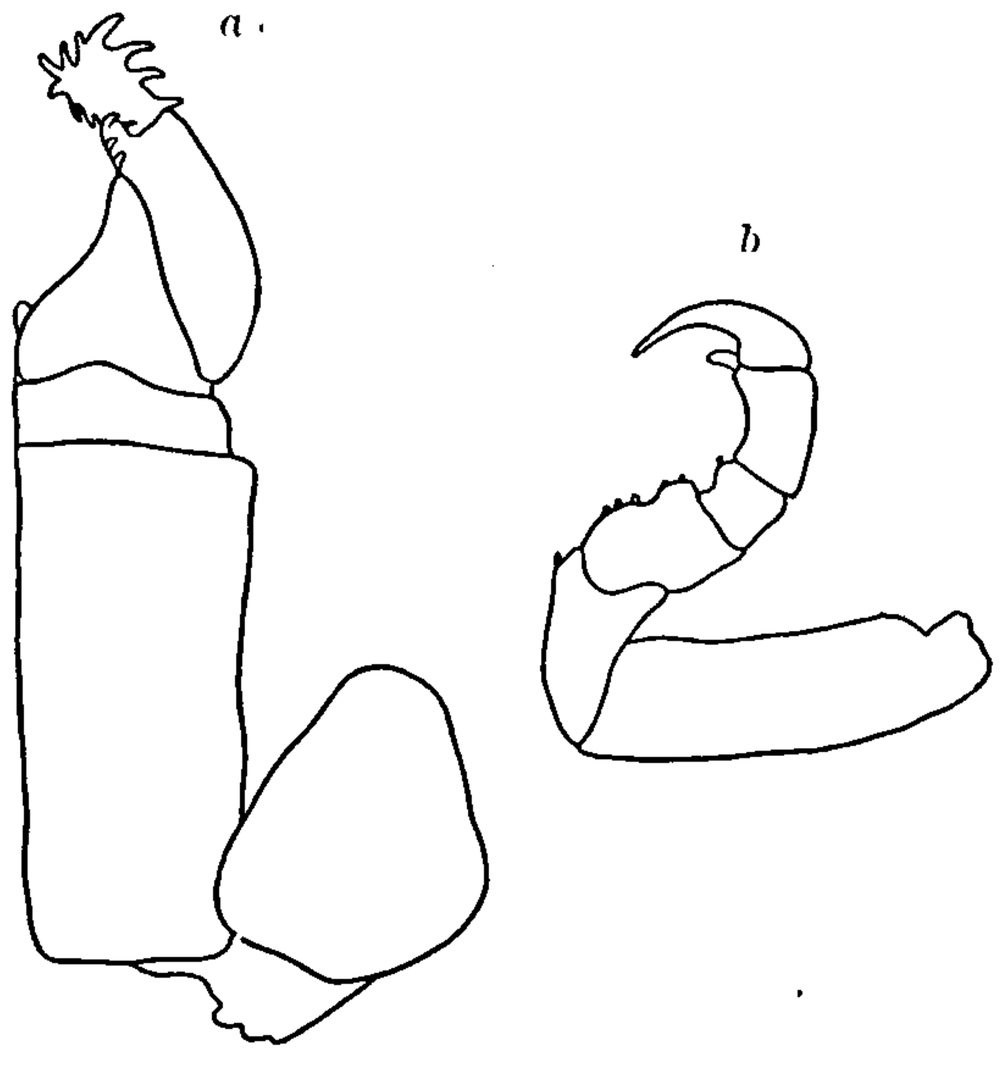

FIG. 155.—ÆGA CRENULATA. *a*, MAXILLIPED. × 27⅓. *b*, SECOND LEG. × 9⅔.

All six segments of the abdomen are distinct. The lateral parts are not separated from the dorsal portion. The sixth or terminal segment has the sides converging to an extremity, which is truncate or but slightly excavate and about half as wide as the base, 3 mm.: 7 mm. The posterior margin is crenulate. The branches of the uropoda are about equal in width; the outer one is rounded posteriorly; the inner one is obliquely truncate, the inner angle rounded, the outer one being more acute. The branches of the uropoda are somewhat crenulate and furnished with spines. The basal article extends two-thirds the length of the last abdominal segment.

The first three pairs of legs are prehensile, the last four pairs ambulatory. The propodus of the second and third pairs is furnished with a linguiform process at the distal end; the carpus has one very small and inconspicuous spine; the merus also has five small inconspicuous spines.[a]

[a] For description of the young of the second and third stages see Schiœdte and Meinert, Nat. Tidsskr. (3), XII, 1879–80, pp. 344–346.

ÆGA WEBBII (Guérin).

Pterelas webbii GUÉRIN, Mag. Zool., Cl. VII, 1836, pl. XX, figs. 1a–e.—MILNE EDWARDS, Hist. Nat. Crust., III, 1840, p. 245.

Ægа webbii SCHIŒDTE and MEINERT, Naturh. Tidssk. (3), XII, 1879–80, pp. 347–348, pl. X, figs. 1–4.

?*Ægа webbii* HARGER, Bull. Mus. Comp. Zool., Harvard College, 1883, XI, No. 4, p. 95.—RICHARDSON, American Naturalist, XXXIV, 1900, p. 218; Proc. U. S. Nat. Mus., XXIII, 1901, p. 522.

Localities.—Off Fernandina, Florida; latitude 31° 57′ north, longitude 78° 18′ 35″ west (Harger); also Cape of Good Hope; Portugal.

Depth.—333 fathoms.

Body oblong-ovate, twice as long as wide, 8 mm. : 16 mm.

Head twice as wide as long, 2 mm. : 4 mm. Anterior margin widely

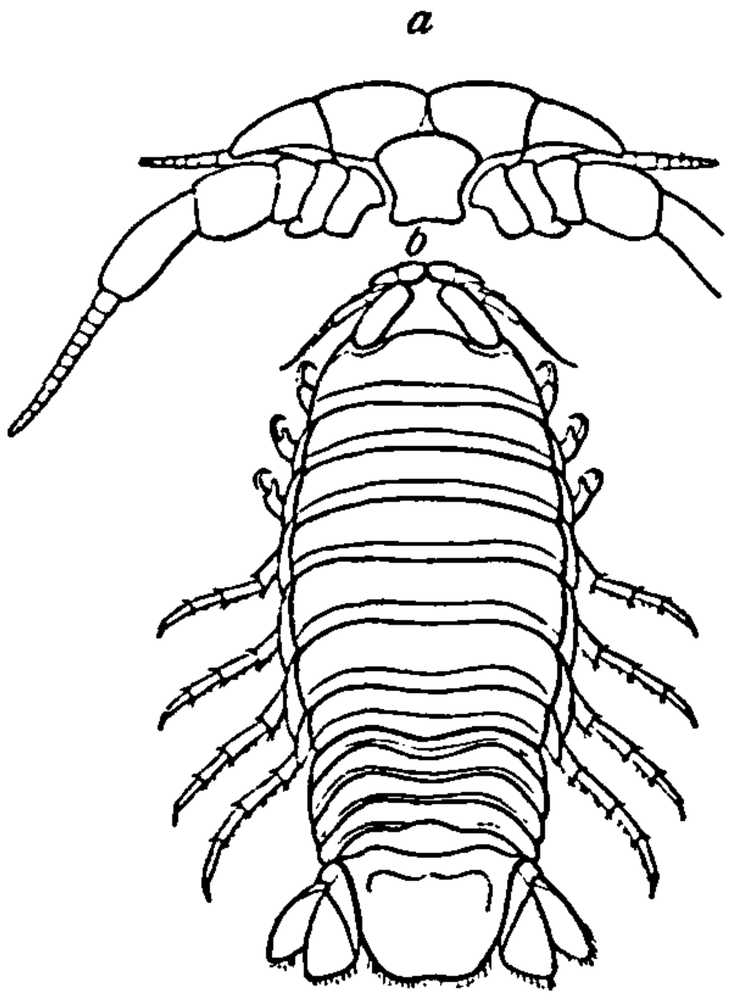

FIG. 156.—ÆGA WEBBII (AFTER SCHIŒDTE AND MEINERT). *a*, FRONTAL MARGIN WITH BOTH PAIRS OF ANTENNÆ AND FRONTAL LAMINA. *b*, ADULT MALE. (ENLARGED.)

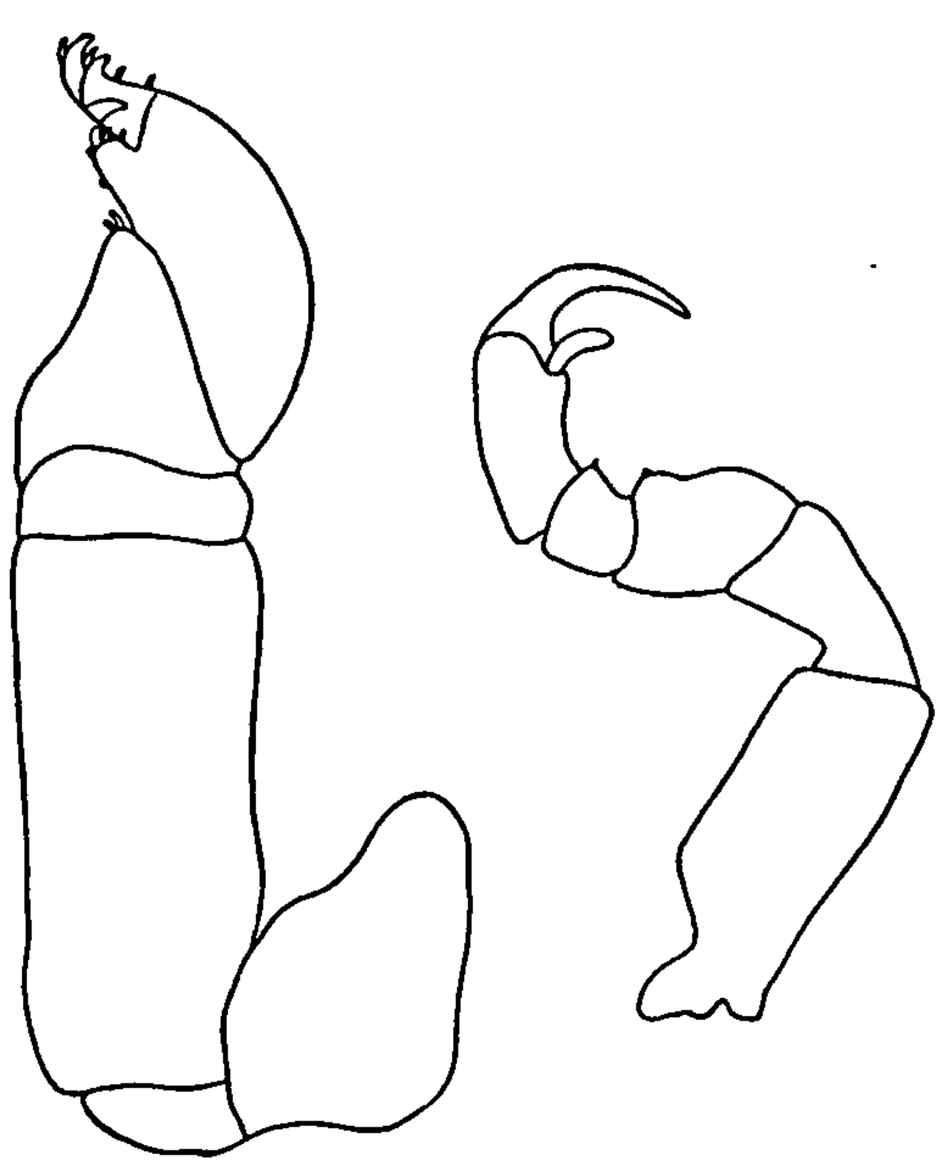

FIG. 157.—ÆGA WEBBII. *a*, MAXILLIPED. ×51¾. *b*, LEG OF THE SECOND PAIR. × 15¼.

rounded and produced in a small median point, which does not arch over the antennæ to meet the frontal lamina on the other side. Eyes large, oval, composite, not contiguous, and separated in front by a distance equal to the width of one eye. The first pair of antennæ have the two basal articles large and dilated, the first one being a little longer and wider than the second one; the second article has the outer distal end produced in a process which extends about half the length of the third article; the third article is about as long and half as wide as the basal article. The flagellum is composed of eight articles. The first antennæ reach the end of the peduncle of the second antennæ, but do not extend to the posterior margin of the head. The second pair of antennæ have the first three articles about equal in length; the fourth article is a little more than twice as long as the third; the fifth is just a little longer than the fourth. The flagellum is composed of

fifteen articles. The second antennæ extend to the posterior margin of the first thoracic segment. The frontal lamina is large, conspicuous, with the basal part ventrally placed, not anteriorly directed, and somewhat quadrate in outline, with the anterior margin a little produced in the middle between the basal articles of the antennæ. The maxilliped has a palp of five articles.

The first, fifth, and sixth segments of the thorax are a little longer than any of the others. The epimera are distinct from the segments, are narrow plates, with a distinct carina extending obliquely across the surface.

All six segments of the abdomen are distinct. The lateral parts are not separated off from the dorsal portion of the segment. There is a distinct carina extending from the posterior angle a short distance across the lateral parts of the first five segments. The sixth or terminal segment is broad, with its posterior extremity truncate, and about half as wide as the basal part of the segment. The posterior margin is denticulate. The uropoda are as long as the terminal segment. The branches are equal in length. The inner one is about one and a half times wider than the outer one, is posteriorly truncate, while the outer one is rounded posteriorly; their posterior margins are faintly crenulate.

The first three pairs of legs are prehensile, the last four pairs ambulatory. There is a linguiform process at the distal end of the propodus of the second and third pairs of legs. On the carpus of these legs is one small blunt spine, on the merus are five small blunt spines, and at the distal end of the ischium are two small ones.

ÆGA LECONTII (Dana).

Ægacylla lecontii DANA, Proc. Acad. Nat. Sci. Phila., VII, 1854, p. 177.—STIMPSON, Bost. Jour. Nat. Hist., VI, 1857, p. 509.—RICHARDSON, Proc. U. S. Nat. Mus., XXI, 1899, pp. 826–827; Ann. Mag. Nat. Hist. (7), IV, 1899, pp. 167–168; American Naturalist, XXXIV, 1900, p. 218.

Localities.—California (Dana); Monterey Bay, California.

Body elongate, oval; surface smooth; color yellow, with a few brown dots; eyes reddish brown.

Head with anterior margin bisinuated, the median point separating the basal joints of the first pair of antennæ and extending one-third the length of these joints. Eyes large, oval, very close together at upper inner angle. First pair of antennæ with basal joints very large, dilated; second joint of peduncle dilated, and with a process at the apex extending nearly the length of the third joint; third joint very narrow, about one-third the width of two preceding joints; flagellum, composed of seven joints, extends the length of the peduncle of second pair of antennæ. Second pair of antennæ, with a flagellum of twelve joints, extend almost to the posterior margin of the first thoracic segment.

The last four thoracic segments are each a little longer than any of the first three. The epimera are narrow. with rounded post-lateral angles.

The five abdominal segments are of equal length. The terminal segment is subtriangular with truncate extremity; its posterior margin is crenulate and fringed with hairs. The uropoda exceed slightly the length of the abdomen. The inner branch is about twice as wide as the outer branch; is obliquely truncate, and crenulate. The outer branch is narrow, rounded posteriorly, and smooth. Both branches are fringed with hairs.

The legs are long and slender. Five spines are present on the merus of the prehensile legs. The gressorial legs are but slightly spinulose.

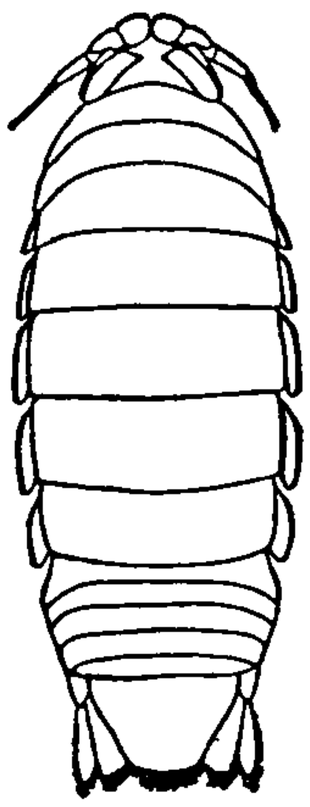

FIG. 158.—ÆGA LECONTII. × 2.

Two specimens examined were collected at Monterey Bay, California, by Mr. Heath.

The description of this species of *Ægа* by Dana as *Ægacylla lecontii* was from a young specimen. The individual sent us is thought to be the adult form, and differs from Dana's description of the young individual in the crenulated posterior margin of the terminal segment, in the truncated inner branch of the uropoda, and in the addition of two joints to the length of the flagellum of the second pair of antennæ.

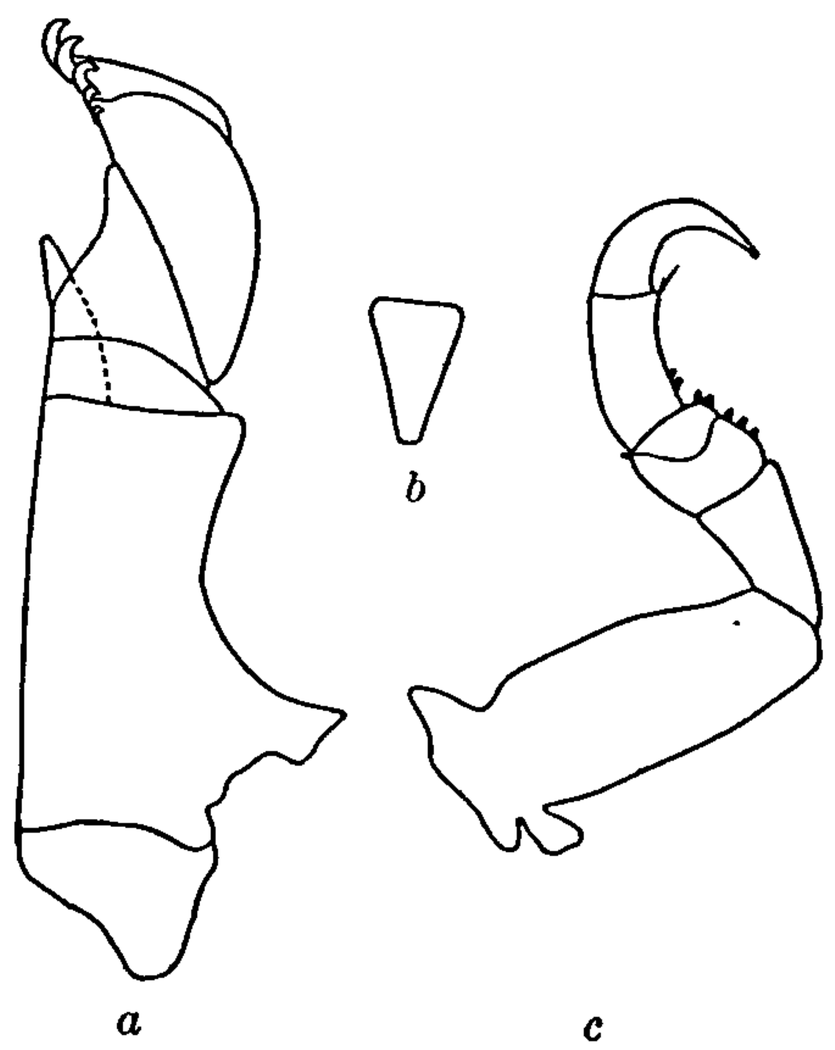

FIG. 159.—ÆGA LECONTII. *a*, MAXILLIPED. × 38¾. *b*, FRONTAL LAMINA (DIAGRAMMATIC). *c*, SECOND LEG. × 11⅓.

ÆGA TENUIPES Schiœdte and Meinert.

Ægа tenuipes SCHIŒDTE and MEINERT, Naturh. Tidsskrift (3), XII, 1879–80, p. 371, pl. IX, figs. 4–6.—RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 522.

Locality.—Cuba.

Body ovate, surface rather smooth but punctate.

Front of head bisinuate, with the frontal point bent downward and contiguous with the frontal lamina.

Frontal lamina rhomboid in shape.

Eyes large, oblong, contiguous along the four series of ocelli.

The first pair of antennæ reach the posterior angle of the first segment of the thorax, extending with the peduncle to the fourth article, with the flagellum to the tenth article of the second pair of antennæ.

The flagellum is composed of eleven articles, with the first article slender, equaling in length the following article.

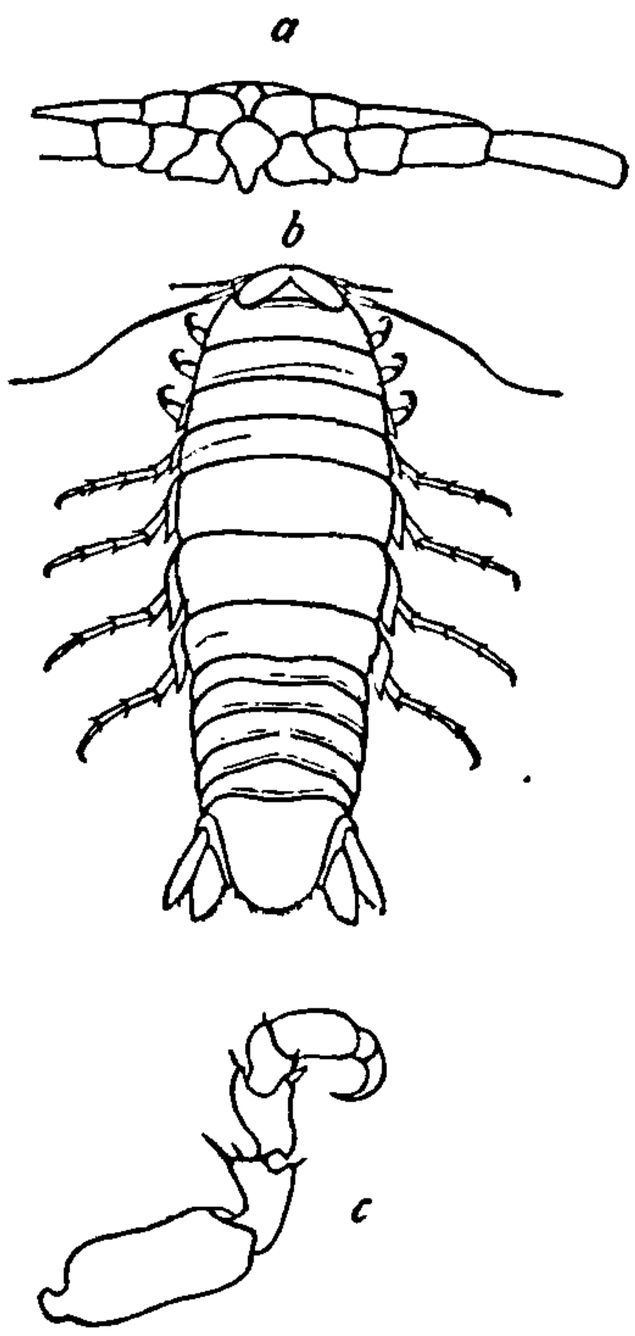

FIG. 160.—ÆGA TENUIPES (AFTER SCHIŒDTE AND MEINERT). *a*, FRONTAL MARGIN WITH ANTENNÆ AND FRONTAL LAMINA. *b*, YOUNG FEMALE: *c*, RIGHT LEG OF SECOND PAIR. (ALL ENLARGED.)

The second pair of antennæ extend to the fourth epimeron; the flagellum is composed of twenty-four articles.

The first segment of the thorax is slightly bisinuate on its dorsal surface. The epimera are rather narrow; the posterior angles of the posterior epimera are acutely produced; the last epimeron extends to the middle of the first segment of the abdomen.

The prehensile legs are slender, smooth; the basis is rather narrow; the anterior ungulæ are rather short, somewhat incurved; the posterior ones are somewhat larger.

The ambulatory legs are produced, slender, and furnished with scattered spines.

The first segment of the abdomen is largely concealed. The last segment is lingulate, posteriorly obscurely crenulate, smooth above. The uropoda are rather long; the inner branch is much longer and wider than the outer branch; both branches are posteriorly attenuated and obscurely crenulated.

Length 11.5 mm.[a]

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[a] The above description is adapted from the following one of Schiœdte and Meinert's:

Producte obovata, supra præter punctaram ordinariam læviuscula.

Frons bisinuata, acumine procumbente laminæ frontali contiguo.

Lamina frontalis rhomboidalis. Oculi magni, oblongi, seriebus ocellorum quaternis contigui. Antennæ primi paris angulum posticum annuli primi trunci attingentes, scapo articulum quartum, flagello articulum decimum antennarum secundi paris explentes; flagellum 11-articulatum, articulo primo tenui, articulum sequentem longitudine æquante.

Antennæ secundi paris epimerum quartum explentes; flagellum 24-articulatum.

Segmentum dorsale annuli primi trunci ante leviter bisinuatum.

Epimera angustiuscula; anguli postici epimerorum posteriorum acuti, producti; epimerum ultimum dimidiam partem articuli primi caudalis explens.

Pedes prensorii graciles, glabriusculi; femora angustiuscula; ungulæ primæ breviusculæ, admodum incurvæ, posteriores aliquanto majores.

Pedes gressorii producti, graciles, parce spinulosi.

Annulus primus caudalis maximam partem detectus.

Annulus analis lingulatus, post obscure crenulatus, supra subæquatus. Pedes anales longiusculi; ramus interior quam exterior multo longior et latior; ramus uterque post attenuatus, obscure crenulatus. Long. 11.5 mm.—SCHIŒDTE AND MEINERT, Nat. Tidsskr. (3), XII, 1879–80, p. 371.

ÆGA DENTATA Schiœdte and Meinert.

Æga dentata SCHIŒDTE and MEINERT, Naturh. Tidsskr. (3), XII, 1879–80, pp. 372–373, pl. x, figs. 11–12.—RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 522.

Locality.—Cuba.

Body ovate, punctate on the dorsal surface with minute scattered dots.

Front of head bisinuate, the median point separating and extending half the length of the first article of the first pair of antennæ.

The frontal lamina is rhomboid in shape.

The eyes are large, oblong, posteriorly acuminate, and contiguous along three series of ocelli.

The first pair of antennæ scarcely reach the posterior angle of the first thoracic segment; with the peduncle they extend to the fourth article, with the flagellum to the tenth article of the second pair of antennæ; the flagellum is composed of seven to eight articles, the first article being very long, slender, equaling in length the three following articles taken together.

The second pair of antennæ extend to the middle of the fifth epimeron; the flagellum is composed of twenty-one articles.

The first segment of the thorax is widely emarginate anteriorly on its dorsal surface; a great part of the dorsal surface of the seventh segment is concealed.

The epimera are rather wide; the posterior angles of the posterior epimera are somewhat acutely produced; the last epimeron extends beyond the first segment of the abdomen.

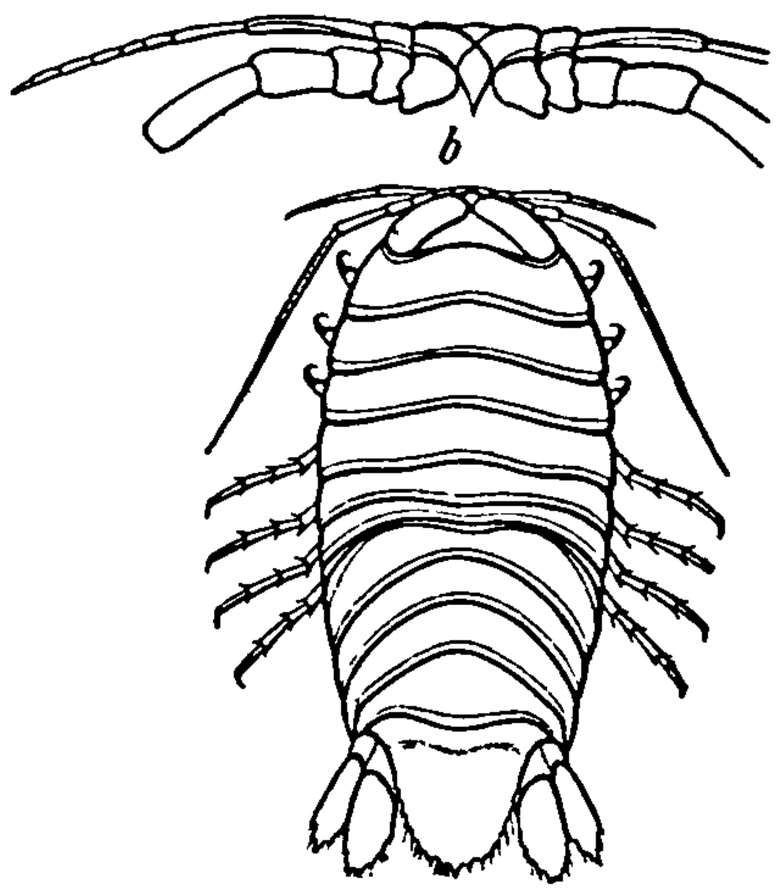

FIG. 161.—ÆGA DENTATA (AFTER SCHIŒDTE AND MEINERT). *a*, FRONTAL MARGIN WITH BOTH PAIRS OF ANTENNÆ AND FRONTAL LAMINA. *b*, YOUNG FEMALE. (ENLARGED.)

The prehensible legs are slender, smooth; the basis is rather narrow; the anterior ungulæ are very small, the posterior ones somewhat larger and more incurved.

The ambulatory legs are rather long, robust, and furnished with scattered spines.

A large part of the first segment of the abdomen is concealed.

The terminal segment is produced linguiform, smooth above; at the base are two obscure depressions; the posterior margin is deeply crenulate, terminating in the middle in seven teeth. The uropoda are rather long; the inner branch is much longer and twice as wide as

the outer branch, and posteriorly widely and obliquely rounded; both branches are furnished posteriorly with numerous rather obtuse teeth.

Length, 7.5 mm.[a]

ÆGA INCISA Schiœdte and Meinert.

Æga incisa Schiœdte and Meinert, Naturhistorisk Tidsskrift (3), XII, 1879–80, pp. 373–374, pl. x, figs. 13–15.—Harger, Bull. Mus. Comp. Zool. Harvard College, XI, 1883, No. 4, p. 96, pl. iii, fig. 1.—Richardson, American Naturalist, XXXIV, 1900, p. 218; Proc. U. S. Nat. Mus., XXIII, 1901, p. 522.

Localities.—Off Fernandina, Florida; off Georgia; off St. Augustine, Florida; latitude 31° 57′ north, longitude 78° 18′ 35″ west.

Depth.—263–440 fathoms.

Body oblong-ovate, about two and a half times longer than wide, 7 mm. : 18 mm.

Head about twice as wide as long, rounded anteriorly and produced in the middle in a small, narrow process, separating the basal articles of the antennæ and meeting the small frontal lamina on the other side. The eyes are large, oblong, and conspicuous, occupying almost the entire surface of the head and contiguous in the median line. The first two articles of the first pair of antennæ are small and equal in length; the third article is long and narrow, nearly three times as long as the second article. The flagellum is composed of sixteen articles.

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[a] The above description is adapted from the following one of Schiœdte and Meinert's:

Ovata, supra præter puncturam ordinariam punctis minutis, perraris sparsa.

Frons bisinuata, acumine procumbente dimidiam partem articuli primi antennarum primi paris discernente.

Lamina frontalis rhomboidalis. Oculi magni, oblongi, post acuminati, seriebus ternis ocellorum contigui.

Antennæ primi paris angulum posticum annuli primi trunci vix attingentes, scapo articulum quartum, flagello articulum decimum antennarum secundi parisexplentes; flagellum 7–8—articulatum, articulo primo perlongo, tenui, articulos tres sequentes conjunctos longitudine æquante.

Antennæ secundi paris dimidiam partem epimeri quinti explentes; flagellum 21—articulatum. Segmentum dorsale annuli primi trunci ante late emarginatum; segmentum dorsale annuli septimi maximam partem obtectum.

Epimera latiuscula; anguli postici epimerorum posteriorum acuti, paulum producti; epimerum ultimum annulum primum caudalem explens. Pedes prensorii graciles, subglabri; femora angustiuscula; ungulæ primæ pusillæ, posteriores aliquanto majores magisque incurvæ.

Pedes gressorii longiusculi, robustiores, parce spinulosi. Annulus primus caudalis maximam partem obtectus. Annulus analis producte lingulatus, supra subæquatus, ad basin obscure bifoveolatus, margine terminali profunde crenulato, medio in dentes septem exeunte. Pedes anales longiusculi; ramus interior quam exterior multo longior et duplo latior, post in obliquum late rotundatus; ramus uterque post in dentes plures obtusiusculos desinens.

Long. 7.5 mm.—Schiœdte and Meinert, Nat. Tidsskr. (3), XII, 1879–80, pp. 372–373.

The first antennæ extend to the posterior margin of the first thoracic segment. The first two articles of the peduncle of the second pair of antennæ are short and about equal in length; the third is a little longer than the second; the fourth and fifth are subequal and each about twice as long as the third. The flagellum is composed of fifteen articles. The second pair of antennæ extend a little beyond the posterior margin of the second thoracic segment. The maxilliped has a palp of five articles. The frontal lamina is very small, somewhat cone-shaped, with base small and irregularly rounded and rather convex.

Fourth, fifth, and sixth segments of the thorax longer than the other four. The epimera of all the segments, from the second to the seventh, inclusive, are distinctly separated from the segments. The posterior angles of the last three segments are produced beyond the posterior margins of the segments, the posterior angle being very acute. In the last three segments a distinct carina extends obliquely from the outer posterior angle to the middle of the side adjacent to the segment. In the epimera of the three anterior segments the carina extends obliquely from the outer post-lateral angle to the inner antero-lateral angle.

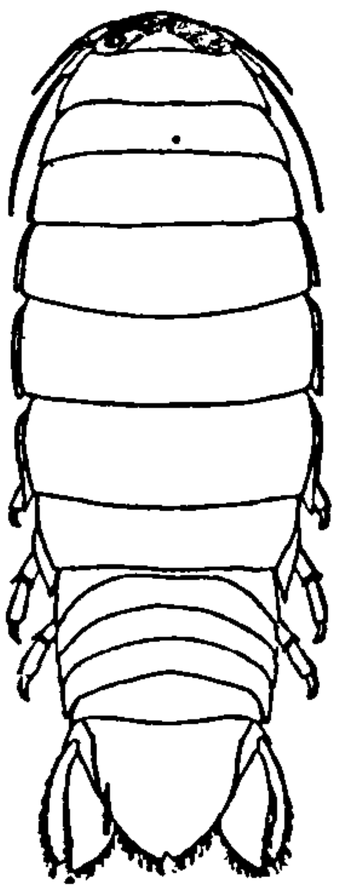


FIG. 162. — ÆGA INCISA (AFTER HARGER). × 3½.

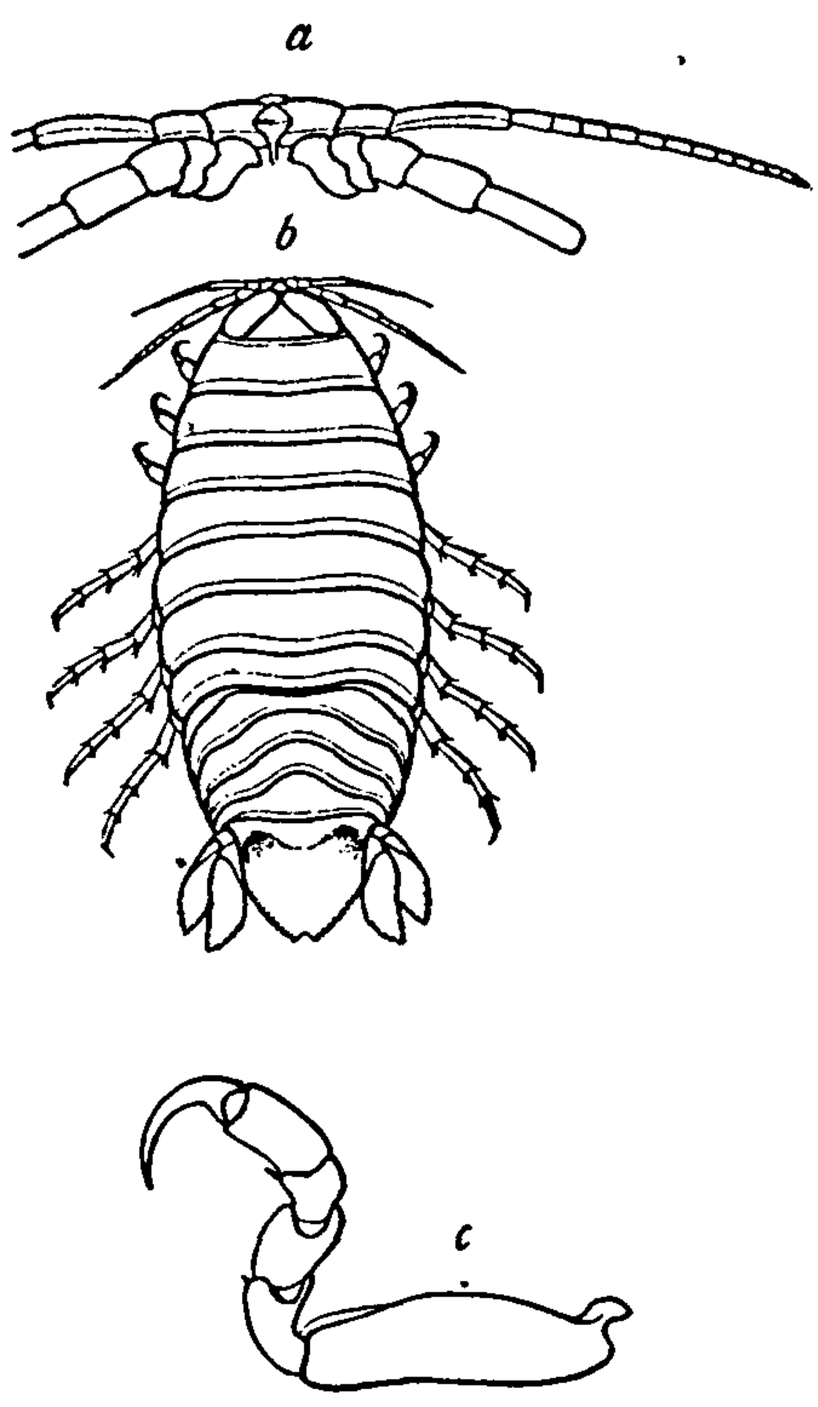


FIG. 163.—ÆGA INCISA (AFTER SCHIŒDTE AND MEINERT). *a*, FRONTAL LAMINA AND BOTH PAIRS OF ANTENNÆ. *b*, YOUNG FEMALE. *c*, LEFT LEG OF THIRD PAIR. (ENLARGED.)

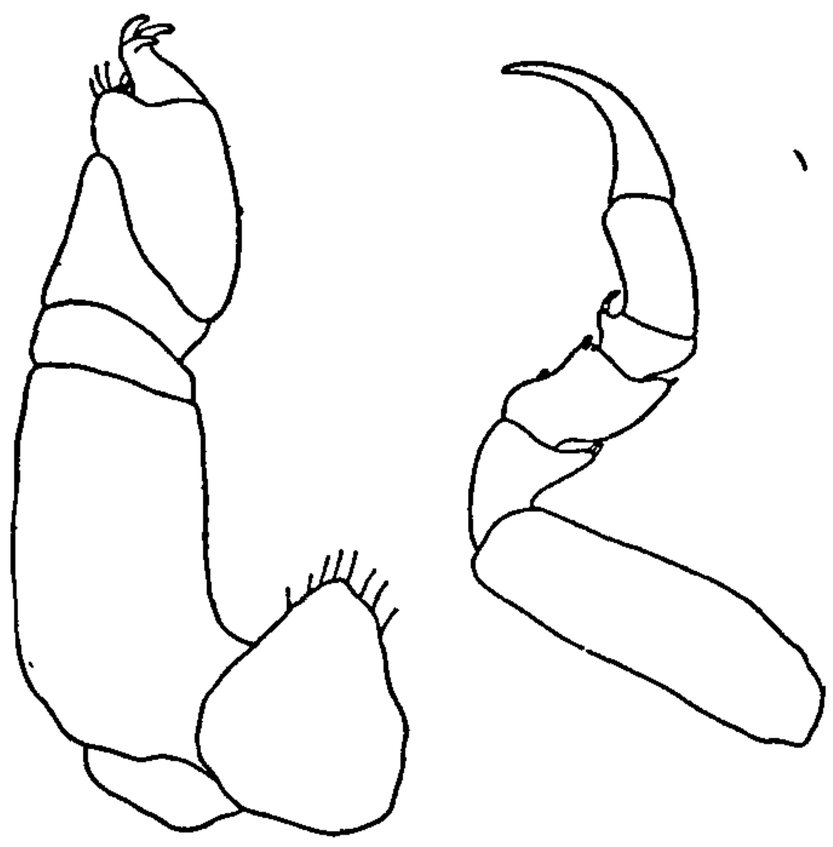


FIG. 164.—ÆGA INCISA. *a*, MAXILLIPED. × 39. *b*, SECOND LEG. × 11½.

All six segments of the abdomen are distinct. The first is partly covered by the last thoracic segment. The lateral parts of the segments are not distinctly separated from the dorsal portion. The sixth or terminal segment is broadly triangulate, with a small round emargination at the apex. On either side of this emargination the posterior margin is denticulate and crenulate for a short distance. There are four spines on either side of the medium notch. The uropoda extend

but a short distance beyond the tip of the terminal segment. The branches are equal in length. The outer branch is narrower than the inner one, and is pointed at its extremity. The inner branch is obliquely truncate, the inner post-lateral angle being widely rounded, the outer one being acute. Both are denticulate and furnished with numerous spines. The basal article of the uropoda extends about half the length of the terminal segment of the abdomen.

The first three pairs of legs are prehensile, the last four pairs ambulatory. In the first three pairs the carpus is armed with one spine, the merus with two.

ÆGA ARCTICA Lütken.

Æga Arctica LÜTKEN, Vid. Medd. Nat. For., 1859, p. 71, pl. 1A, figs. 1–3.—SCHIŒDTE and MEINERT, Naturh. Tidsskrift (3), XII, 1879–80, pp. 374–375.—HANSEN, Videnskabelige Meddelelser fra den Naturhistoriske Forening i Kjøbenhavn, 1887–88, pp. 183–184.—RICHARDSON, American Naturalist, XXXIV, 1900, p. 218; Proc. U. S. Nat. Mus., XXIII, 1901, p. 522.

Localities.—Umanek and Hundeöerne near Egedesminde, Greenland; also Iceland and Finmark.

Found on *Somniosus microcephalus.*

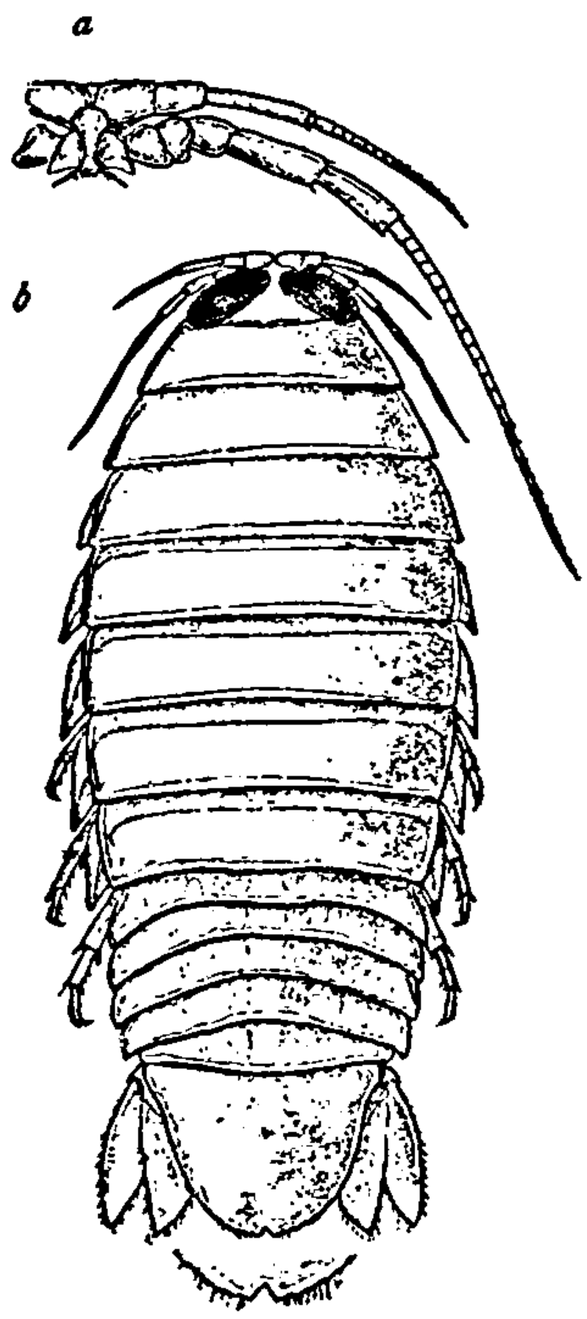


FIG. 165.—ÆGA ARCTICA (AFTER SARS). *a*, FIRST AND SECOND ANTENNÆ. *b*, GENERAL FIGURE. × 3.

Body oblong-ovate, nearly two and a half times longer than broad, 14 mm.: 34 mm.

Head twice as wide as long, 3 mm.: 6 mm., with the anterior margin widely rounded and produced in a small median point between the basal articles of the first pair of antennæ. Eyes large, oval, composite, occupying almost the entire surface of the head, and nearly, but not quite, contiguous in the median line. The first pair of antennæ have the first two articles short and subequal, neither article being dilated; the third article is a little longer than the first two taken together. The flagellum is composed of eighteen articles and extends almost to the middle of the first thoracic segment. The second pair of antennæ have the first three articles short and subequal; the fourth and fifth are subequal and each is about twice as long as the third. The flagellum is composed of twenty-five articles and extends to the posterior margin of the second thoracic segment. The maxilliped has a palp of five articles. The frontal lamina or inter-antennal plate is somewhat triangular in shape, the apex pointing downward on the ventral side, the base meeting the apex of the median point of the frontal margin.

The first three segments of the thorax are subequal, each being 3 mm. long. The fourth and seventh are subequal, and each is 3½ mm. in length. The fifth and sixth are each 4 mm. in length. The epimera are distinctly separated on all the segments with the exception of the first. They are broad plates, with the outer post-lateral angles of the first two and the last two acute. All are crossed obliquely by an arched carina.

All six segments of the abdomen are distinct. The sixth or terminal segment is rounded posteriorly, with a small round median notch. The uropoda do not extend beyond the extremity of the terminal abdominal segment. Both branches are of equal length. The inner one is a little wider than the outer branch. The margins are entire and crenulate, and furnished with spines. The outer post-lateral angle of both branches terminates in two small points.

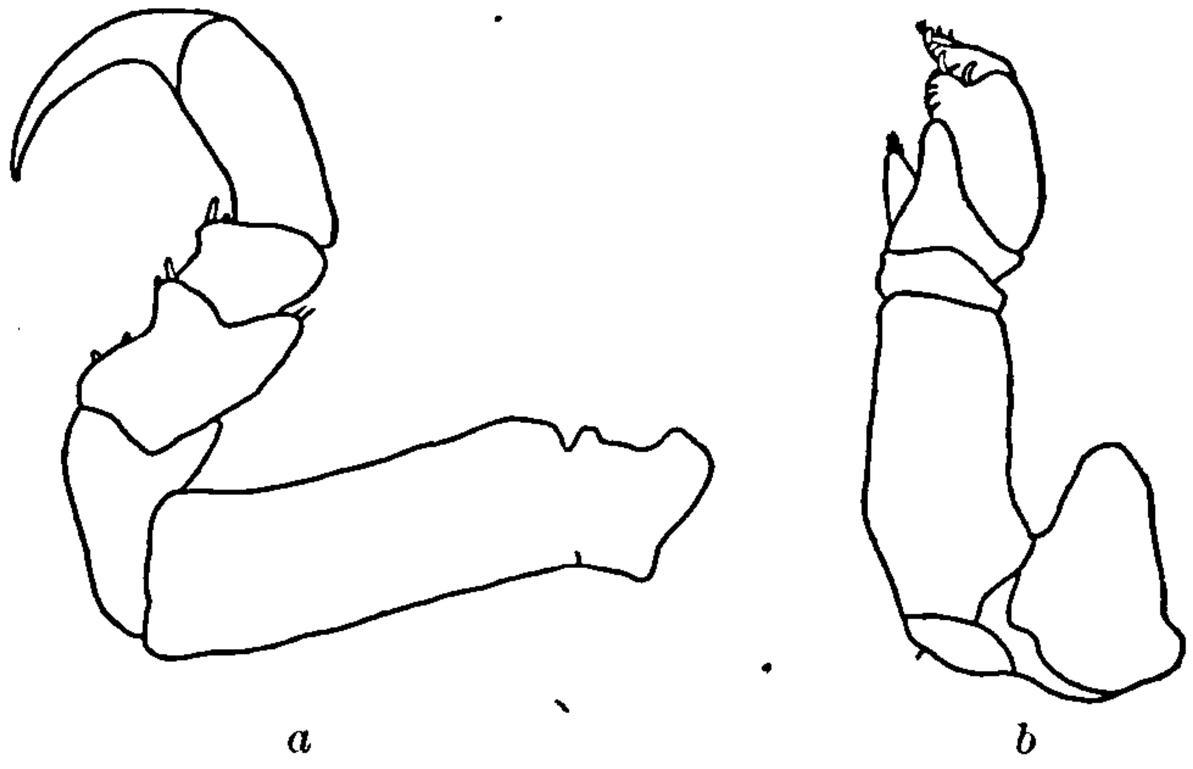


FIG. 166.—ÆGA ARCTICA. *a*, LEG OF SECOND PAIR. × 27⅓. *b*, MAXILLIPED. × 15⅓.

The first three pairs of legs are prehensile; the last four pairs are ambulatory. The merus of the first three pairs is armed with one large and one small spine, the carpus with one large and three small spines.

ÆGA GRACILIPES Hansen.

Æga gracilipes HANSEN, Isopoden, Cumaceen und Stomatopoden der Plankton Expedition, 1895, pp. 15–16, pl. 1, figs. 6–6c.—RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 523.

Localities.—Gulf of Mexico; North Atlantic, latitude 59° north, longitude 8.5° west.

Depth.—730 fathoms; 1,524 meters (Hansen).

Body ovate, about twice as long as wide, 11 mm.: 21 mm.

Head with the anterior margin widely rounded, and produced in a narrow process, which arches over the antennæ, separating the basal articles, and meets the small frontal lamina on the other side. The eyes are large, oblong, composite, and occupy almost all of the dorsal surface of the head, extending from the lateral angles along the anterior margin and almost meeting in the median line. The first two articles of the first pair of antennæ are subequal; the third is nearly three times as long as the second. The flagellum is composed of eighteen articles. The first antennæ extend a little beyond the posterior margin of the first thoracic segment. The first two articles of the second antennæ are subequal; the third is a little longer than the

second; the fourth is twice as long as the third; the fifth is a little shorter than the fourth. The flagellum is composed of eighteen articles. The second pair of antennæ extend to the posterior margin of the third thoracic segment. The frontal lamina or inter-antennal plate is about twice as broad as long, transversely placed, has the base somewhat oval in shape and directed anteriorly. The maxilliped has a palp of five articles.

The segments of the thorax are of nearly equal length, the first segment being a little longer and the seventh a little shorter than any of the others. The epimera are very distinctly separated on all the segments. They are broad plates, with very acute post-lateral angles, which in the last three epimera are produced beyond the posterior margin of the segment. There is a carina on all the epimera which extends from the post-lateral angle to the middle of

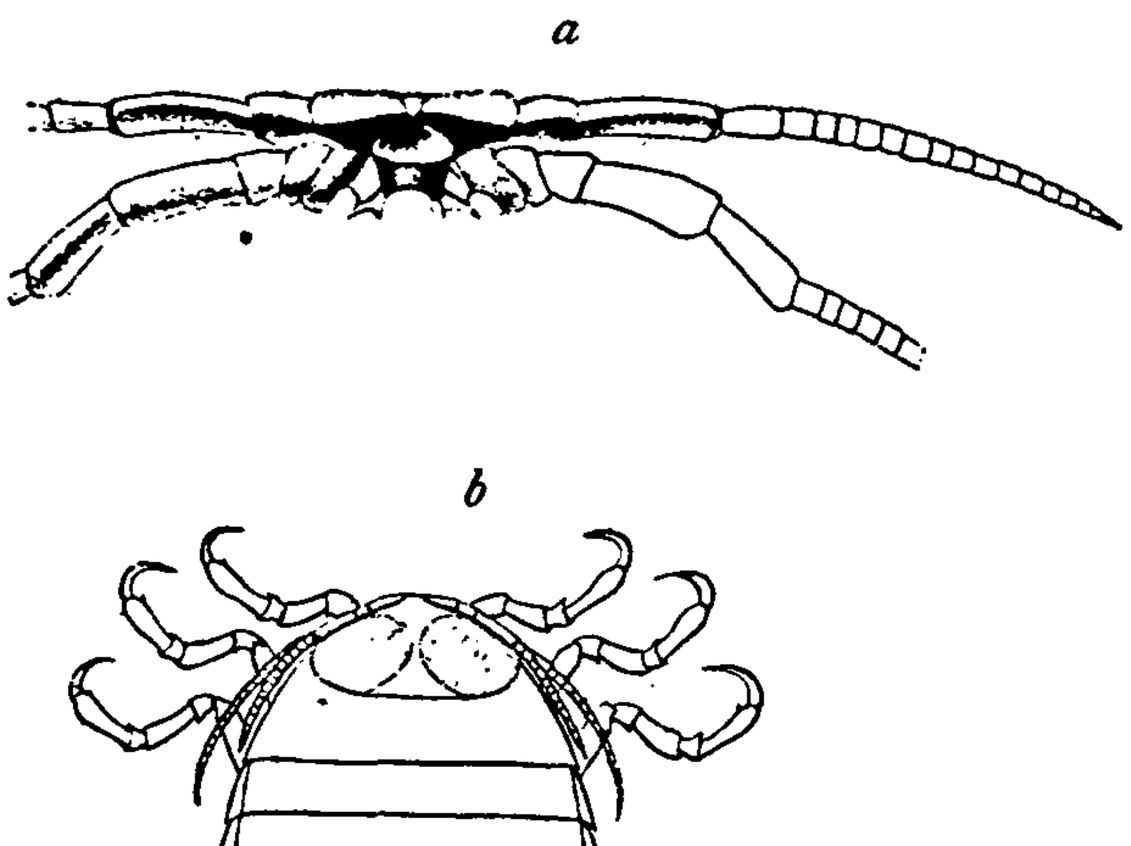


FIG. 167.—ÆGA GRACILIPES (AFTER HANSEN). *a*, FRONTAL PART OF HEAD FROM UNDERSIDE. *b*, GENERAL FIGURE. (ENLARGED.)

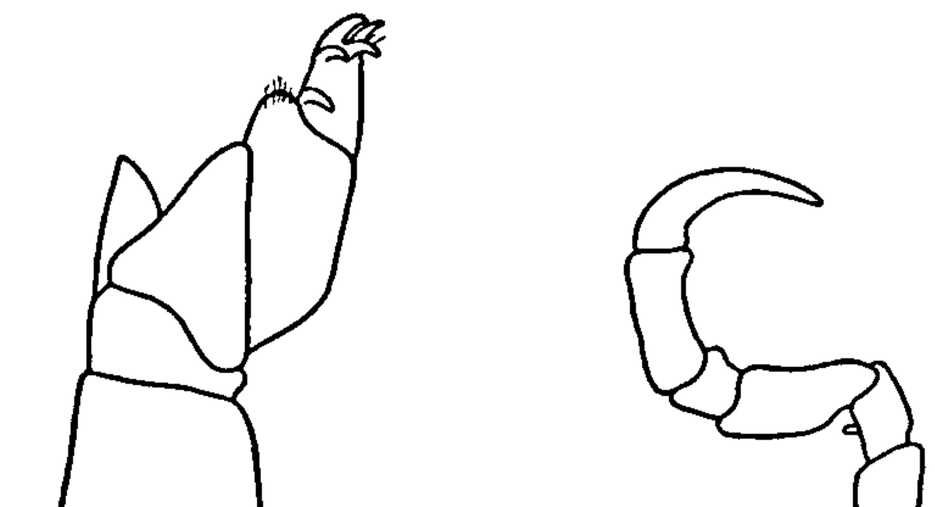


FIG. 168.—ÆGA GRACILIPES. *a*, MAXILLIPED, × 27⅓. *b*, LEG OF SECOND PAIR. × 9⅓.

the side adjacent to the segment in the last three and to the inner antero-lateral angle in the first two; in the third epimera it extends to a point about halfway between the middle of the side adjacent to the segment and the inner antero-lateral angle.

All six segments of the abdomen are distinct, the first one being partly covered in the middle of the dorsal surface by the seventh thoracic segment. The lateral parts of the segments are not distinct from the dorsal portion. The sixth or terminal segment is broadly rounded at the sides with the posterior margin produced in the middle in an acute point. On either side of the median point the margin is denticulate and furnished with about five spines. The uropoda extend to the tip of the terminal segment. The branches are equal in length,

and both are pointed at the posterior extremity. The inner branch is very slightly excavate on the exterior margin about 1 mm. from the extremity. Both branches are denticulate and furnished with spines.

The first three pairs of legs are prehensile, the last four pairs ambulatory. All the legs are very slender and free from spines.

ÆGA SYMMETRICA Richardson.

Æga symmetrica RICHARDSON, Bull. U. S. Fish Comm., XXIV, 1905, pp. 211–212.

Localities.—Vicinity of Naha Bay, Behm Canal, southeast Alaska; Queen Charlotte Sound, off Fort Rupert, Vancouver Island, British Columbia.

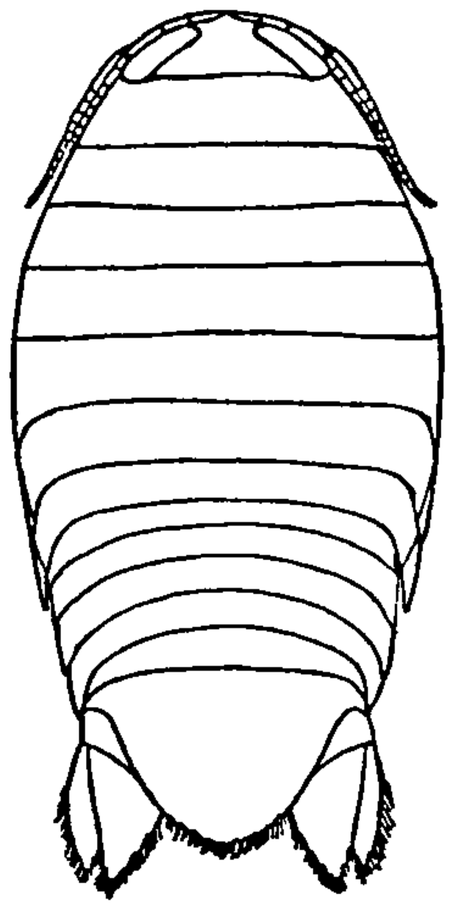
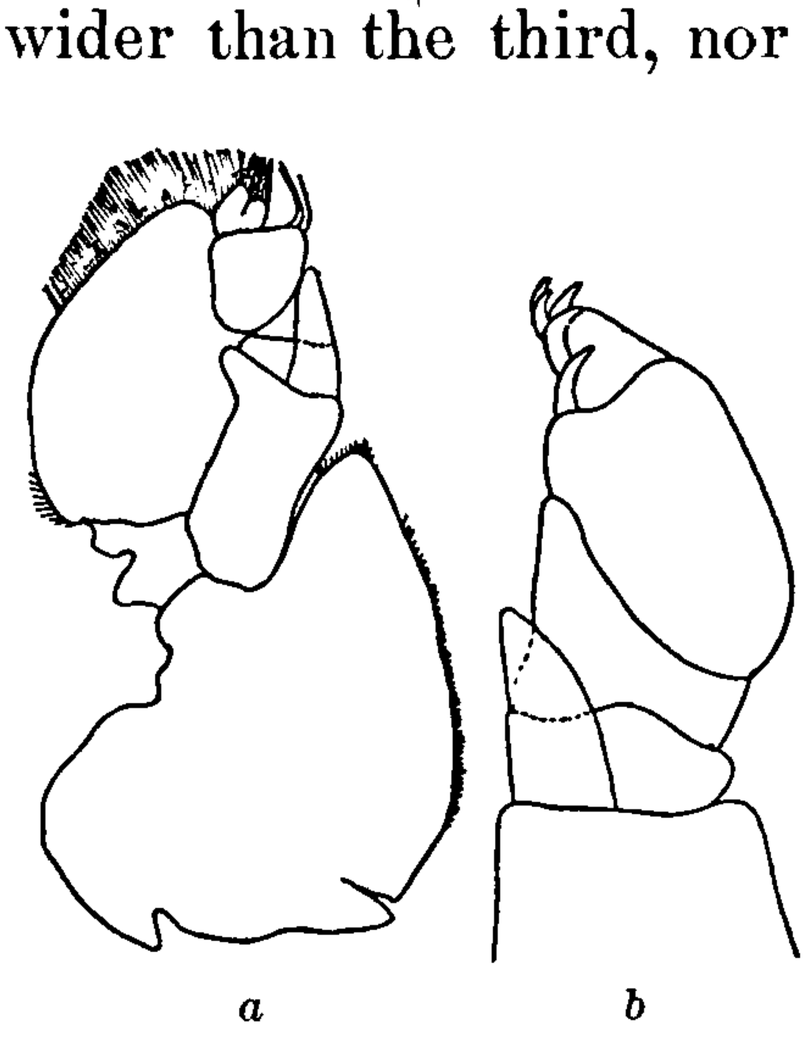


FIG. 169.—ÆGA SYMMETRICA. × 2⅘.

Body ovate, twice as long as broad. Color yellow, densely covered with light-brown dots, which form a regular line along the margin of each segment. Surface smooth. Head with frontal margin produced in a median point, which arches over the basal joints of the antennæ and meets the frontal lamina or interantennal plate on the underside. The eyes are narrow and elongate, composed of numerous ocelli. They are separated in front by a distance equal to the length of one eye. The first pair of antennæ extend to the posterior margin of the first thoracic segment; the joints of the peduncle are not dilated, although the first two joints are somewhat wider than the third, nor is there a process at the distal extremity of the second joint. The first two joints are of equal length; the third is as long as the first two together; the flagellum is composed of eleven joints. The second pair of antennæ reach the middle of the third thoracic segment; the flagellum is composed of sixteen joints. The frontal lamina or interantennal plate is conical, with the distal end flat, the proximal end produced to an acute point.



a *b*

FIG. 170.—ÆGA SYMMETRICA. *a*, MAXILLIPED. × 27⅓. *b*, PALP OF SAME. × 51⅔.

The several segments of the thorax are about equal in length, the last one being slightly shorter. The epimera are large, subquadrate, with the outer distal angle of the last three produced posteriorly beyond the margin of their respective segments.

The first three pairs of legs have the propodus beset with three small spines along the inner margin; the carpus is short and armed with one spine; the merus is provided with five spines and the ischium

has one long spine at the outer distal angle. The following four pairs of legs are long and slender, furnished with hairs at the distal extremity of the joints and armed with few spines.

The first five segments of the abdomen are short, the first is shortest, and the fifth the longest in the median dorsal line. The terminal or sixth segment of the abdomen is linguiform and rounded posteriorly with serrulated margin.

The uropoda extend a little beyond the posterior margin of the terminal abdominal segment; the outer branch is narrow, ovate, and pointed at the distal extremity; the inner branch is almost twice as wide as the outer one; both have serrulated margins.

FIG. 171.—ÆGA SYMMETRICA. THIRD LEG. × 11½.

Four specimens come from the U. S. Bureau of Fisheries steamer *Albatross* station 4228, vicinity of Naha Bay, Behm Canal, southeastern Alaska, and one from *Albatross* station 4199, Queen Charlotte Sound, off Fort Rupert, Vancouver Island, British Columbia, at depths of 41 to 107 fathoms. The type specimen is in the U. S. National Museum (Cat. No. 29247). The following note by Mr. Harold Heath accompanies the Fort Rupert specimen: "Eyes black. Rusty-brown spots on dorsal surface. Vermilion-colored ovary (?) shows through translucent cuticle."

Only two other species of *Æga* are known in the Pacific coast fauna of North America, *Æga leconti*i (Dana)[a] and *Æga microphthalma* Dana.[b] The present species differs from *Æga leconti*i, (1) in the greater length of both pairs of antennæ; those of the first pair reach to the posterior margin of the first thoracic segment, instead of to the end of the peduncle of the second pair or almost to the posterior margin of the head, and those of the second pair reach to the middle of the third thoracic segment instead of almost to the posterior margin of the first; (2) in having neither the basal joints of the peduncle of the first pair of antennæ greatly dilated nor the second joints with a process at the apex extending nearly the length of the third joint; (3) in the much shorter body, as compared with the width; (4) in having the terminal segment rounded, not truncate, at the apex; (5) in the longer uropoda; (6) in having the median point of the frontal margin of the head arch over the basal joints of the antennæ to meet the frontal lamina on the ventral side, and (7) in the different shape of the frontal lamina.

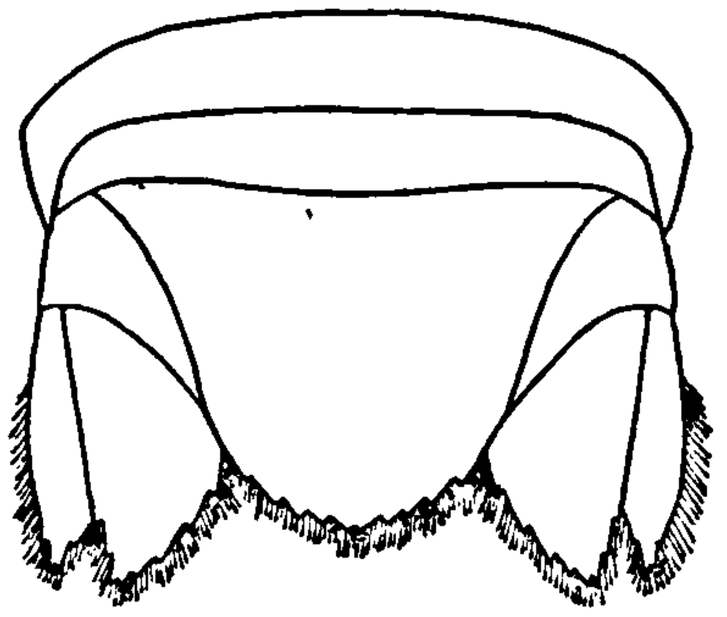


FIG. 172.—ÆGA SYMMETRICA. POSTERIOR PART OF ABDOMEN. × 6½.

The present species differs from *A. microphthalma* in the longer first pair of antennæ, which reach the posterior margin of the first

[a] Proc. U. S. Nat. Mus., XXI, 1899, pp. 826–827.

[b] Proc. Acad. Nat. Sci. Phila., VII, 1854, p. 176.

thoracic segment; in Dana's species they are shorter than the basal part (peduncle) of the external or second pair of antennæ; in the larger eyes, which are narrow and elongate instead of being round and very small; in the longer uropoda, the branches in *A. microphthalma* scarcely surpassing the abdomen; in not having the apex of the inner branch "faintly arcuate obliquely" and in having all six segments of the abdomen visible in a dorsal view, only five being apparent in *A. microphthalma*.

This species differs from *Æga longicornis* Hansen in the shorter second antennæ, which extend only to the middle of the third thoracic segment, while in *A. longicornis* they extend to the middle of the fifth thoracic segment; in having the first three pairs of legs furnished with a greater number of spines than in Hansen's species; in having both branches of the uropoda terminating in a bifid extremity, while in *A. longicornis* the extremities of the uropoda are acute, and in having the apex of the terminal abdominal segment bifid instead of acutely pointed.

A specimen from off Santa Cruz Island, California, agrees with the specimens from Alaska, with the exception that the second antennæ have fourteen instead of sixteen articles to the flagellum. They are, however, just as long, extending to the middle of the third thoracic segment.

ÆGA VENTROSA M. Sars.

Æga ventrosa M. SARS, Chr. Vid. Selsk. Förh., 1858–59, pp. 154–156.—SCHIŒDTE and MEINERT, Natur. Tidsskr. (3), XII, 1879–80, pp. 375–377, pl. IX, figs. 7–8.

Ægiochus nordenskiöldii BOVALLIUS, Bihang Sv. Vet.-Akad. Handl., X, 1885, No. 9, p. 5, pl. I–II.

Æga loveni BOVALLIUS, Bihang Sv. Vet.-Akad. Handl., XI, No. 17, 1886–87, pp. 3–6, pl. I, figs. 1–10.

Ægiochus ventrosus BOVALLIUS, Bihang Sv. Vet.-Akad. Handl., XI, No. 17, 1886–87, pp. 8–9.

Æga nordenskiöldii HANSEN, Vidensk. Meddel. Naturh. Foren. i Kjøbh., 1887–88, pp. 184–187.

Æga ventrosa G. O. SARS, Crust. Norway, II, 1899, p. 64, pl. XXVI, fig. 3.—RICHARDSON, American Naturalist, XXXIV, 1900, p. 218; Proc. U. S. Nat. Mus., XXIII, 1901, p. 522.—NORMAN, Ann. Mag. Nat. Hist. (7), XIV, 1904, p. 432.

Localities.—Greenland; latitude 59° 33′ north, longitude 43° 25′ west; also coast of Norway; Finland.

Depth.—120 fathoms; 203–312 fathoms (Norman).

Body oblong-ovate, about two and one-third times longer than wide, 13 mm.: 30 mm.

Head twice as wide as long, 3 mm.: 6 mm. In the median line the front is produced in a process which arches over the antennæ, separating the basal articles, and meets the frontal lamina or interantennal plate at its upper end. The eyes are large, irregularly oval, composite, situated in the lateral angles of the head and extending along

the anterior margin, being separated in front by a distance equal to the length of one eye. The basal article of the peduncle of the first pair of antennæ is larger and a little longer than the second article; the third article is very slender and about twice as long as the second article. The flagellum is composed of about fourteen articles. The first pair of antennæ extend a little beyond the end of the peduncle of the second pair, to the end of the fourth article of the flagellum, or two-thirds the length of the first thoracic segment. The first three articles of the peduncle of the second pair of antennæ are subequal; the fourth article is twice as long as the second; the fifth is one and a half times longer than the fourth. The flagellum is composed of twenty-five articles. The second antennæ extend a little beyond the posterior margin of the third thoracic segment. The frontal lamina is cone-shaped, the base of the cone being large and conspicuous, directed anteriorly and slightly concave. The frontal process of the head slightly overlaps the edge of the base of the cone.

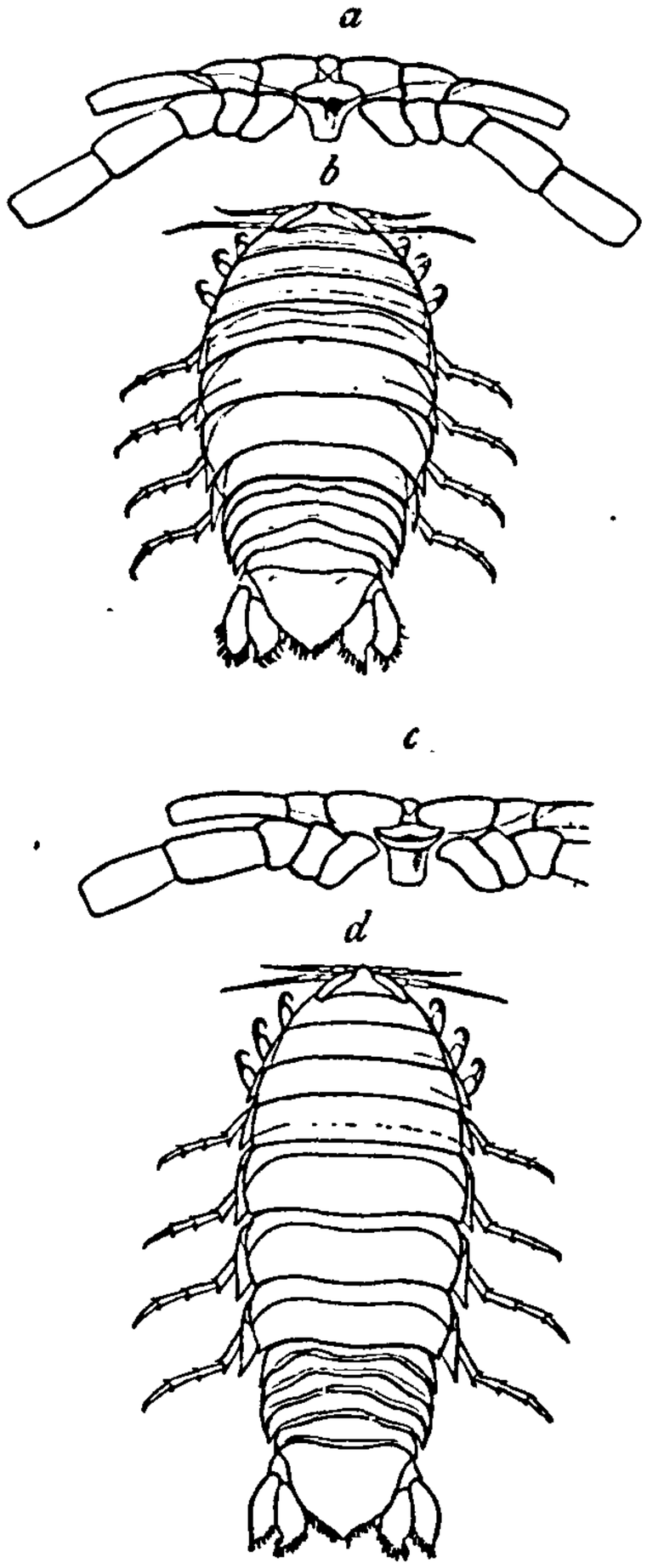


FIG. 173.—ÆGA VENTROSA (AFTER SCHIŒDTE AND MEINERT). *a*, FRONTAL MARGIN WITH BOTH ANTENNÆ AND FRONTAL LAMINA OF ADULT FEMALE. *b*, ADULT FEMALE. *c*, FRONTAL MARGIN WITH BOTH ANTENNÆ AND FRONTAL LAMINA OF YOUNG FEMALE. *d*, YOUNG FEMALE. (ALL ENLARGED.)

The first, fourth, fifth, and sixth segments are somewhat longer than any of the others. The post-lateral angles of the first segment are very acute. The epimera of all the segments, from the second to the seventh, inclusive, are distinctly separated off from the segments. They are broad plates occupying the entire lateral margins of the segments. In all, the post-lateral angles are acute, but especially so in the epimera of the second, third, and seventh segments. In all the epimera there is a distinct carina, extending from the outer post-lateral angle to about the middle of the side adjacent to the segment in the last four, but to the inner antero-lateral angle in the first two. The epimeron of the seventh segment is produced posteriorly beyond the posterior margin of the segment.

All six segments of the abdomen are distinct, although the first is partly covered dorsally in the middle by the seventh thoracic segment. The lateral parts of these segments are not separated off from the dorsal portion, but are completely fused. The terminal segment is broadly rounded posteriorly with a small point in the middle. The posterior

margin is crenulate. The peduncle of the uropoda has the inner part produced a little beyond the middle of the sixth segment of the abdomen. The outer branch is half as wide as the inner branch; it is pointed at the extremity. The inner branch has the posterior extremity obliquely truncate. Both branches are equal in length and crenulate; they do not extend beyond the tip of the abdomen. The first three pairs of legs are prehensile; the last four pairs ambulatory. In the first three pairs the propodus is furnished with one spine, the carpus with one, the merus with three.

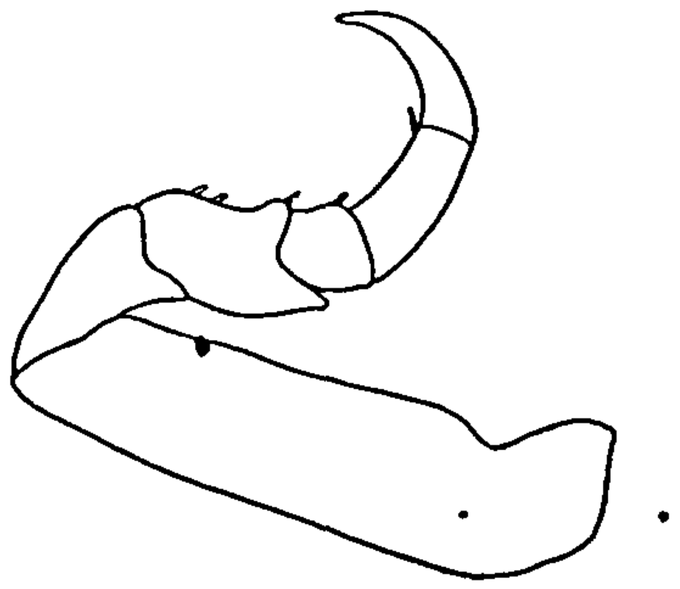


FIG. 174.—ÆGA VENTROSA. LEG OF SECOND PAIR.

ÆGA MICROPHTHALMA Dana.

Æga microphthalma DANA, Proc. Acad. Nat. Sci. Phila., VII, 1854, p. 176.—STIMPSON, Bost. Jour. Nat. Hist., VI, 1857, p. 508.—RICHARDSON, Proc. U. S. Nat. Mus., XXI, 1899, p. 826; Ann. Mag. Nat. Hist. (7), IV, 1899, p. 167; American Naturalist, XXXIV, 1900, p. 218.

Locality.—Monterey, California.

The eyes are rounded, very small. The body above is bare, smooth. The second pair of antennæ are rather long; the flagellum is composed of nearly twenty-four articles; the first pair of antennæ are shorter than the peduncle of the second pair. The legs are almost bare, the anterior ones are short, with the fourth article armed on the inferior margin with five to six very short, spine-form teeth; the eight posterior ones are short, beset with spines at the apex of the articles. The abdomen is composed of four segments, the posterior segment being triangulate, with apex rounded and pubescent, and with the sides rather straight. The uropoda are armed at the base with a slender and long spine scarcely shorter than the branches; the branches extend very little beyond the abdomen, are furnished with short hairs, the inner branch is wide, with apex obliquely arcuate, the outer branch half as wide as the inner branch, short and lanceolate. Length 6‴.[a]

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[a] The above description is adapted from the following one of Dana's:

Oculi subrotundi, parvuli. Corpus superficie nudum, læve. Antennæ externæ longiusculæ, flagello ferme 24 articulato; internæ basi externarum breviores. Pedes fere nudi; antici breves, articulo 4to, 5–6 dentibus spiniformibus brevissimus infra armato; 8 postici breves, apice articulorum spinulosi. Abdomen 4 articulatum, segmento postico triangulato apice rotundato et pubescente, lateribus rectiusculis. Styli caudales spinâ tenui et longâ ramis parce breviore ad basin armati; ramis abdomen vix superantibus, breviter ciliatis, interno lato, apice oblique leviter arcuato, externo dimidio angustiore, breviter lanceolato.—Long. 6.‴

The six epimerals either side are large, and, excepting the two anterior, they project behind, beyond the segment to which they belong. The eight hinder legs are naked, excepting the spines at apex and one or two sets of minute spines on the under side of some of the joints.—DANA, Proc. Acad. Nat. Sci. Phila., VII, 1854, p. 176.

31. Genus ROCINELA Leach.

Body depressed. Abdomen not much narrower than thorax. Eyes present, well developed, and conspicuous.

First two articles of the peduncle of the first pair of antennæ not expanded. Frontal lamina small and narrow.

Mandibles with a linguiform lamella (molar expansion?). Palp of the maxillipeds composed of two articles.

First three pairs of legs with propodus more or less expanded and armed with spines; dactylus forming a very large, evenly curved hook. Four posterior pairs with the propodus short.

ANALYTICAL KEY TO THE SPECIES OF THE GENUS ROCINELA.

a. Eyes contiguous ..... *Rocinela oculata* Harger
a′. Eyes not contiguous.
  b. Flagellum of second pair of antennæ composed of from fourteen to sixteen articles.
    c. First thoracic segment with antero-lateral angles produced horn-like at sides of head ..... *Rocinela cornuta* Richardson
  c′. First thoracic segment with antero-lateral angles not produced horn-like at sides of head.
    d. Propodus of prehensile legs armed with from two to four spines.
      e. Eyes very close together ..... *Rocinela insularis* Schiœdte and Meinert
      e′. Eyes widely separated.
        f. Head bicarinated, the two carinæ being separated by a longitudinal median groove ..... *Rocinela dumerilii* (Lucas)
        f′. Head without carinæ.
          g. Front of head produced in a widely rounded spatulate process. Two tubercles on head ..... *Rocinela cubensis* Richardson
          g′. Front of head not produced in a widely rounded spatulate process. No tubercles on head.
            h. Spots present on both sides of the fourth thoracic segment. *Rocinela maculata* Schiœdte and Meinert
            h′. Spots wanting on both sides of the fourth thoracic segment.
              i. Spots present on fourth and fifth abdominal segments and base of terminal segment ..... *Rocinela belliceps* (Stimpson)
              i′. Spots wanting on fourth and fifth abdominal segments and base of terminal segment.. *Rocinela americana* Schiœdte and Meinert
    d′. Propodus of prehensile legs armed with from four to six spines or with as many teeth.
      e. Propodus of prehensile legs armed with a process the edge of which is furnished with six teeth, meeting squarely and without interval. *Rocinela propodialis* Richardson
      e′. Propodus of prehensile legs not armed with denticulate process, but furnished with spines.
        f. Abdomen much longer than wide. Outer branch of uropoda one and a half times wider than inner branch. Propodus of prehensile legs armed with five or six spines. Abdomen broad when compared with thorax, last segment widely rounded. Second antennæ extend to the middle of the third thoracic segment ..... *Rocinela laticauda* Hansen

f'. Abdomen about as wide as long. Outer branch of uropoda twice as wide as inner branch. Propodus of prehensile legs armed with four spines. Abdomen narrow when compared with thorax, tapering, last segment narrowly rounded. Second antennæ extend to the middle of the second thoracic segment.....*Rocinela angustata* Richardson

b'. Flagellum of second pair of antennæ composed of from ten to eleven articles.

c. Small tubercles present on the posterior margins of all the segments of the thorax. Propodus of prehensile legs armed with three spines.

Rocinela tuberculosa Richardson

c'. No tubercles on body. Propodus of prehensile legs unarmed or armed with only one spine.

d. Terminal segment of abdomen ornamented with a pair of narrow semilunar bands, separated by a longitudinal stripe. Propodus of prehensile legs unarmed.....*Rocinela signata* Schiœdte and Meinert

d'. Terminal segment of abdomen ornamented with a very wide crescentiform band from the posterior border of which three large hastiform stripes project backwards. Propodus of prehensile legs armed with one spine.

Rocinela aries Schiœdte and Meinert

ROCINELA OCULATA Harger.

Rocinela oculata HARGER, Bull. Mus. Comp. Zool., Harvard College, XI, No. 4, 1883, pp. 97–99, pl. III, fig. 2–2a; pl. IV, fig. 1.—RICHARDSON, American Naturalist, XXXIV, 1900, p. 219; Proc. U. S. Nat. Mus., XXIII, 1901, p. 523.

Locality.—Latitude 32° 18′ 20″ north, longitude 78° 43′ west.

Depth.—252 fathoms.

"Body oval, length a little more than twice the breadth, surface sparsely punctate.

"Head subreniform, produced in front into a truncated process over the bases of the antennulæ, yoke-shaped behind, the ocular lobes projecting, upper surface nearly covered with the large eyes in which the ocelli are large and quincuncially arranged in ten rows along the long axis of each eye. Five of these rows meet along the median line.

"The antennulæ are slender and scarcely attain the tip of the antennal peduncle; the basal segment is short and concealed from above; the second is longer than the first; the third is slender, but not as long as the first two together; flagellum about as long as the peduncle, slender and composed of five segments, of which the first is much the longest and the last is the shortest, and does not quite attain the posterior border of the eye when the antennula is reflexed. The antennæ surpass the first thoracic segment; the first two segments are very short; the flagellum is about twelve-jointed.

"First thoracic segment closely adapted to the head in front; fourth segment longest in the median line above; sixth short; seventh nearly concealed and quite small, although bearing a well-developed pair of legs below.

"The epimera of the second and third segments are oblique, but not acute nor produced backward in a lateral view; in the four following segments they are produced and very acute; the seventh epimeron is

much smaller than the sixth, and, owing to the shortness of the seventh segment, ends behind about on a line with it, both epimera surpassing the first segment of the pleon.

"Legs of the first pair slender, armed with a long slender dactylus, much curved near its base; propodus expanded with a large palmar lobe armed with a marginal row of eight curved spines; carpus short, with a single curved palmar spine. Legs of the second and third pair much like the first, but with only six spines on the propodus. Legs of the fourth and posterior pairs slender, armed with spines principally at the distal ends of the ischium, merus, and carpus.

"First segment of the pleon very short and nearly concealed by the thoracic segments, narrower than the next three segments, which are about equal, acutely produced at the sides so as to resemble in shape the seventh epimeron; fifth segment narrower than fourth, but somewhat longer on the median line; telson semi-oval, regularly rounded behind and ciliated. Uropods equaling the telson; inner angle of basal segment produced, about one-third the length of the inner ramus, which is lingulate, rounded behind, slightly shorter than the outer, and less than half as broad; outer ramus subovate, spinulose along the outer border; both rami ciliated except near the base.

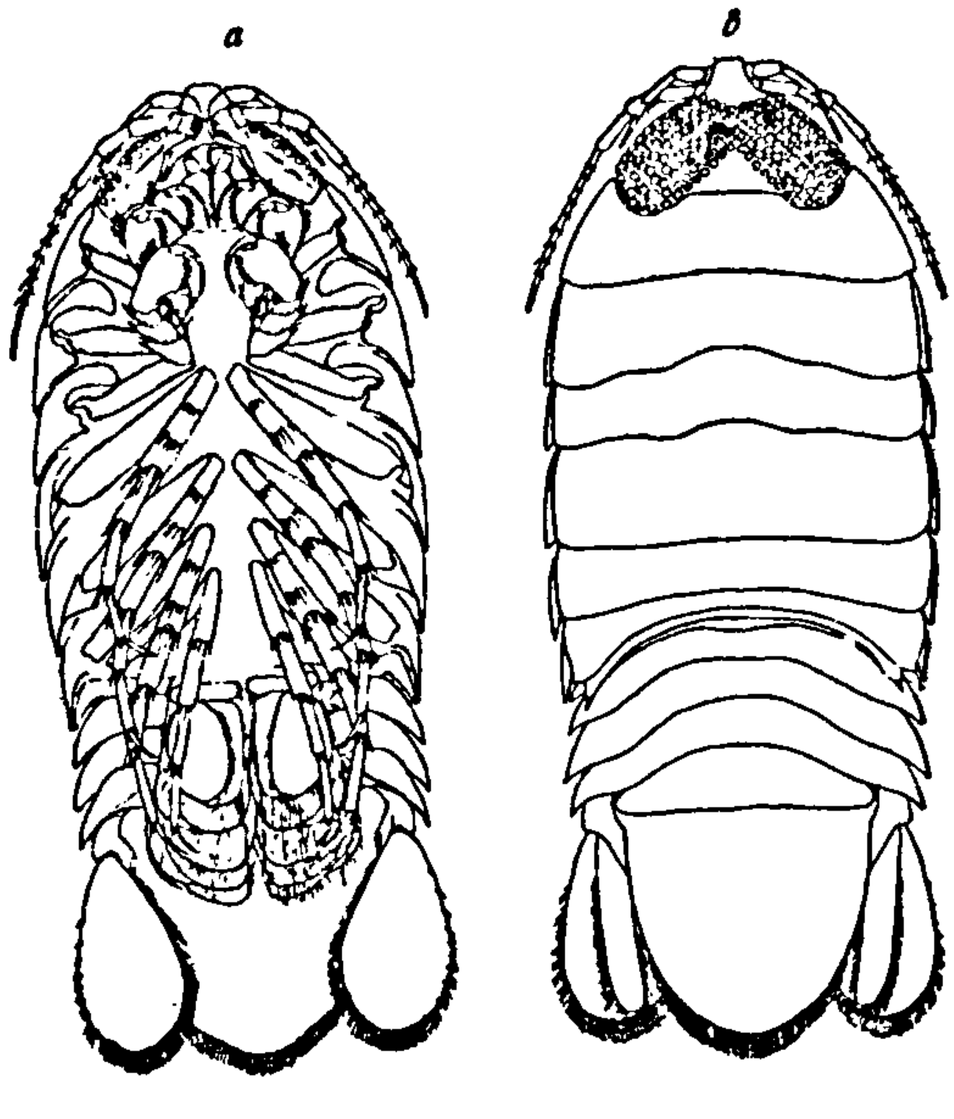


FIG. 175.—ROCINELA OCULATA (AFTER HARGER). *a*, VENTRAL VIEW. × 4. *b*, DORSAL VIEW. × 4. *c*, LEG OF FIRST PAIR. × 10.

Length, 13.5 mm.; breadth, 6 mm.

A single specimen of this species, the only one as yet known, was taken at Station 305, latitude 32° 18′ 20″ north, longitude 73° 43′ west, from a depth of 252 fathoms."—HARGER.[a]

ROCINELA CORNUTA Richardson.

Rocinela cornuta RICHARDSON, Proc. Amer. Philos. Soc., XXXVII, 1898, p. 12, figs. 1–2; Proc. U. S. Nat. Mus., XXI, 1899, p. 827; Ann. Mag. Nat. Hist. (7), IV, 1899, p. 169; American Naturalist, XXXIV, 1900, p. 219.

Locality.—Off Shumagin Bank, Alaska.

Depth.—625 fathoms.

[a] Bull. Mus. Comp. Zool. Harvard College, XI, No. 4, Pt. 23, 1883, pp. 97–98.

Length of body two and one-quarter times its greatest breadth. Outline oval; surface smooth, with scattered points of depression. Head subtriangular, having a medium excavation. Its frontal margin is produced forward in a long and broad projection, widely rounded at its extremity, and curving upward. Eyes large and situated some distance apart. The first antenna reaches the anterior margin of the first thoracic segment; its flagellum is composed of six articles. The second antenna extends to the posterior margin of the second thoracic segment; its flagellum is sixteen-jointed.

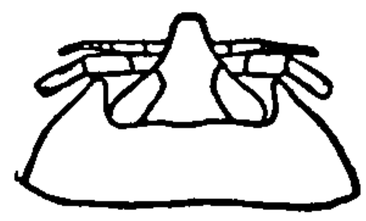
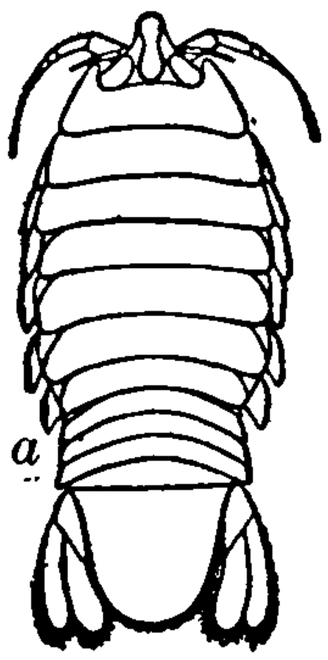


FIG. 176.—ROCINELA CORNUTA. HEAD. × 1⅜.



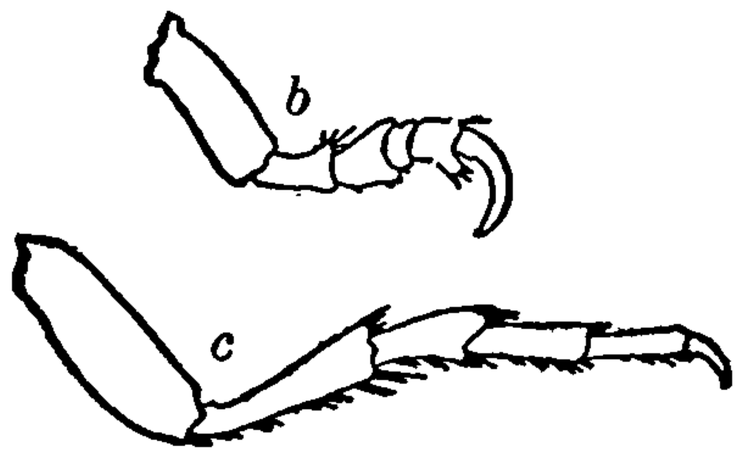


FIG. 177.—*a*, ROCINELA CORNUTA, MALE, SLIGHTLY REDUCED. *b*, LEG OF FIRST PAIR. × 4. *c*, LEG OF FOURTH PAIR. × 4.

The thoracic segments are subequal. The antero-lateral angles of the first segment are greatly produced and extend forward a little less than half the length of the head, including the projection. These antero-lateral projections of the first segment do not follow closely the lines of the head, but rather extend out straight in a direction which is parallel to that of the frontal projection of the head. The extremities of these projections are rounded. The epimera of all the segments point downward and do not extend beyond the post-lateral angle of their respective segments with the exception of the sixth and seventh ones.

The first segment of the abdomen is almost entirely covered by the seventh thoracic segment. The last segment is rounded posteriorly and is faintly crenulate. The two branches of the uropods are similar in shape and size; the inner branch, being the longer, reaches the extremity of the abdomen. The uropods as well as the abdominal segments are furnished with hairs.

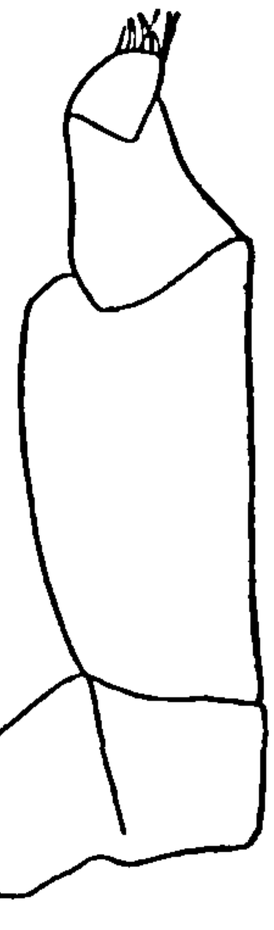


FIG. 178.—ROCINELA CORNUTA. MAXILLIPED. × 20½.

The propodus of the prehensile feet is armed with three spines, and three blunt ones are found on the merus. The gressorial feet are long and slender and covered with spines.

Type.—The type specimen was found off Shumagin Bank, Alaska, Station 3338, 625 fathoms (Cat. No. 20086, U.S.N.M.).

ROCINELA INSULARIS Schiœdte and Meinert.

Rocinela insularis SCHIŒDTE and MEINERT, Naturhistorisk Tidsskrift (3), XII, 1879–80, pp. 390–391, pl. XII, figs. 1–3.—RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 523.

Localities.—West Indies; between Delta of the Mississippi and Cedar Keys, Florida; off Fernandina, Florida.

Depth.—227–273 fathoms.

Body oblong-ovate, about two and a half times longer than wide, 10 mm.: 25 mm.

Head, two and a half times wider than long, 2 mm.: 5 mm.; triangular in shape, the front produced over the basal articles of the antennæ. Eyes large, composite, oval, and occupying a large part of the dorsal surface of the head, being very close together in front, but not contiguous. Basal article of first antenna small and almost entirely concealed by the front of the head; second article twice as long as first; third article nearly twice as long as second. Flagellum is composed of six articles. The first pair of antennæ extend to the end of the peduncle of the second antennæ, or to the antero-lateral angle of the first thoracic segment. The second pair of antennæ have the first two articles short, the first article a little longer than the second; the third is twice as long as the first; the fourth is but little longer than the third; the fifth is one and a half times longer than the fourth. The flagellum is composed of fifteen articles. The second antennæ extend to the posterior margin of the second thoracic segment. The frontal lamina is small and almost inconspicuous. It is rhomboid-shaped at the base and ventrally placed. The maxilliped has a palp of two articles.

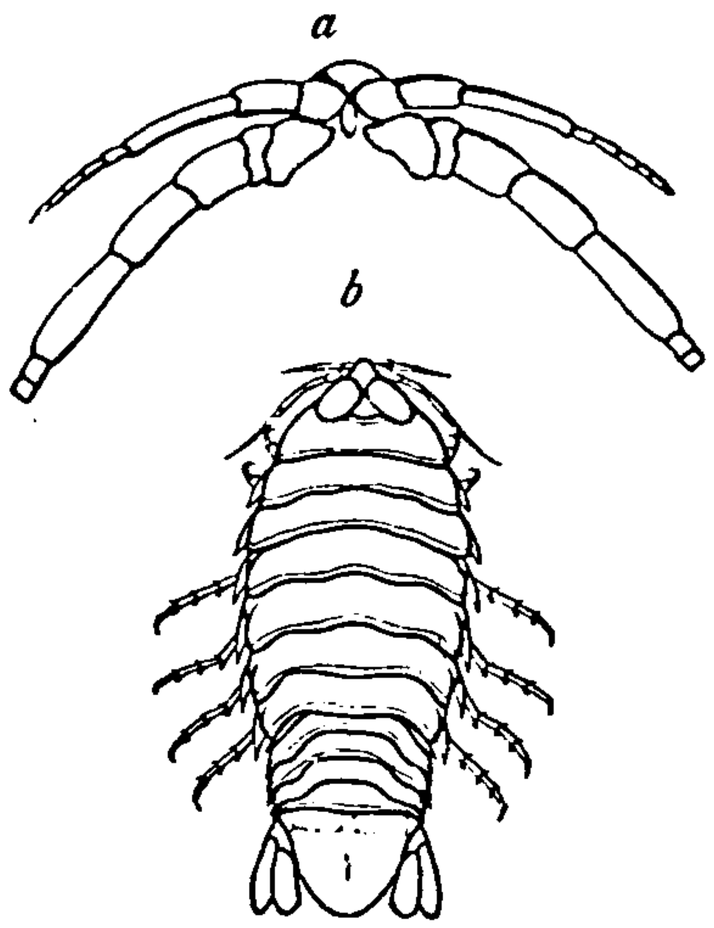


FIG. 179.—ROCINELA INSULARIS (AFTER SCHIŒDTE AND MEINERT). *a*, FRONTAL MARGIN WITH BOTH PAIRS OF ANTENNÆ AND FRONTAL LAMINA. *b*, ADULT MALE. (ENLARGED.)

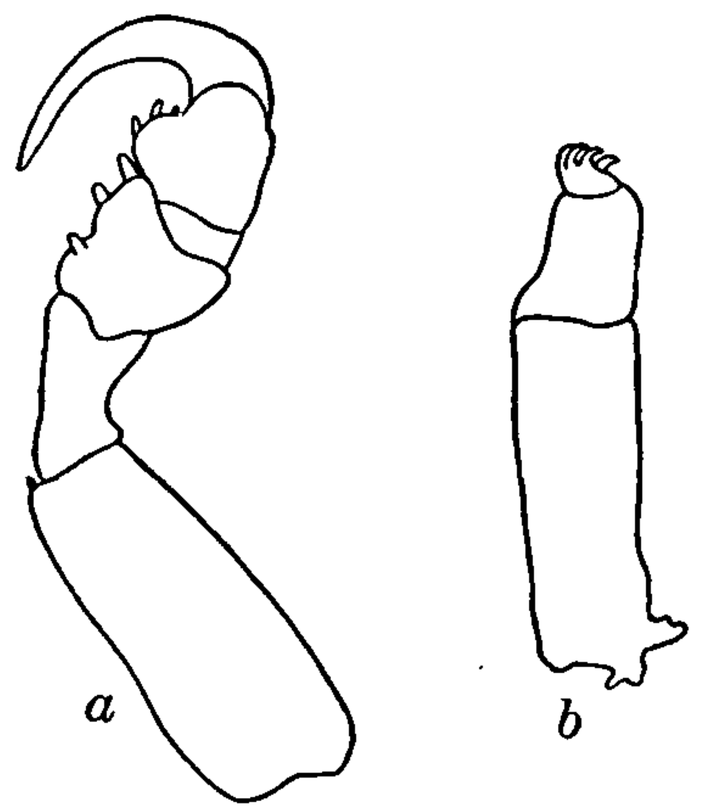


FIG. 180.—ROCINELA INSULARIS. *a*, SECOND LEG. × 11½. *b*, MAXILLIPED. × 20½.

The first three segments of the thorax are subequal; the fourth is slightly longer than any of the preceding ones; the last three are the largest. The epimera are distinct from the segments. They are narrow plates, with the posterior extremities very acute in the last four. The first two have the posterior extremities rounded. The epimera of the seventh segment are produced beyond the poste-

rior margin of the segment. They are all crossed obliquely by faint carinæ.

All six segments of the abdomen are distinct and visible. The first is almost entirely covered in the middle by the seventh thoracic segment, but is uncovered at the sides. The sixth or terminal segment is posteriorly rounded. The uropoda do not extend beyond the extremity of the terminal segment. The outer branch is a little shorter and narrower than the inner branch; both are rounded at the posterior extremity and furnished with spines. There are also a few spines on the posterior margin of the terminal segment of the body. The peduncle of the uropoda extends about two-thirds the length of the terminal abdominal segment.

The first three pairs of legs are prehensile, the last four pairs ambulatory. The first pair of legs have two spines on the propodus, the second and third pairs have three; all three anterior pairs of legs have three spines on the merus. The ambulatory legs are beset with spines.

ROCINELA DUMERILII (Lucas).

Acherusia dumerilii Lucas, Expl. Sc. Algér., Zool., I, 1849, p. 79, pl. vii, fig. 3.

Acherusia complanata Grube, Ins. Lussin Meeresf., 1864, p. 76.

Rocinela dumerilii Schiœdte and Meinert, Naturhistorisk Tidsskrift (3), XII, 1879–80, pp. 391–393, pl. xii, figs. 1–6.—Bovallius, Bihang till k. Sv. Vet.-akad. Handl., XI, 1886–87, No. 17, pp. 9–10.—Richardson, Proc. U. S. Nat. Mus., XXIII, 1901, p. 524.—Norman, Ann. Mag. Nat. Hist. (7), XIV, 1904, p. 436.

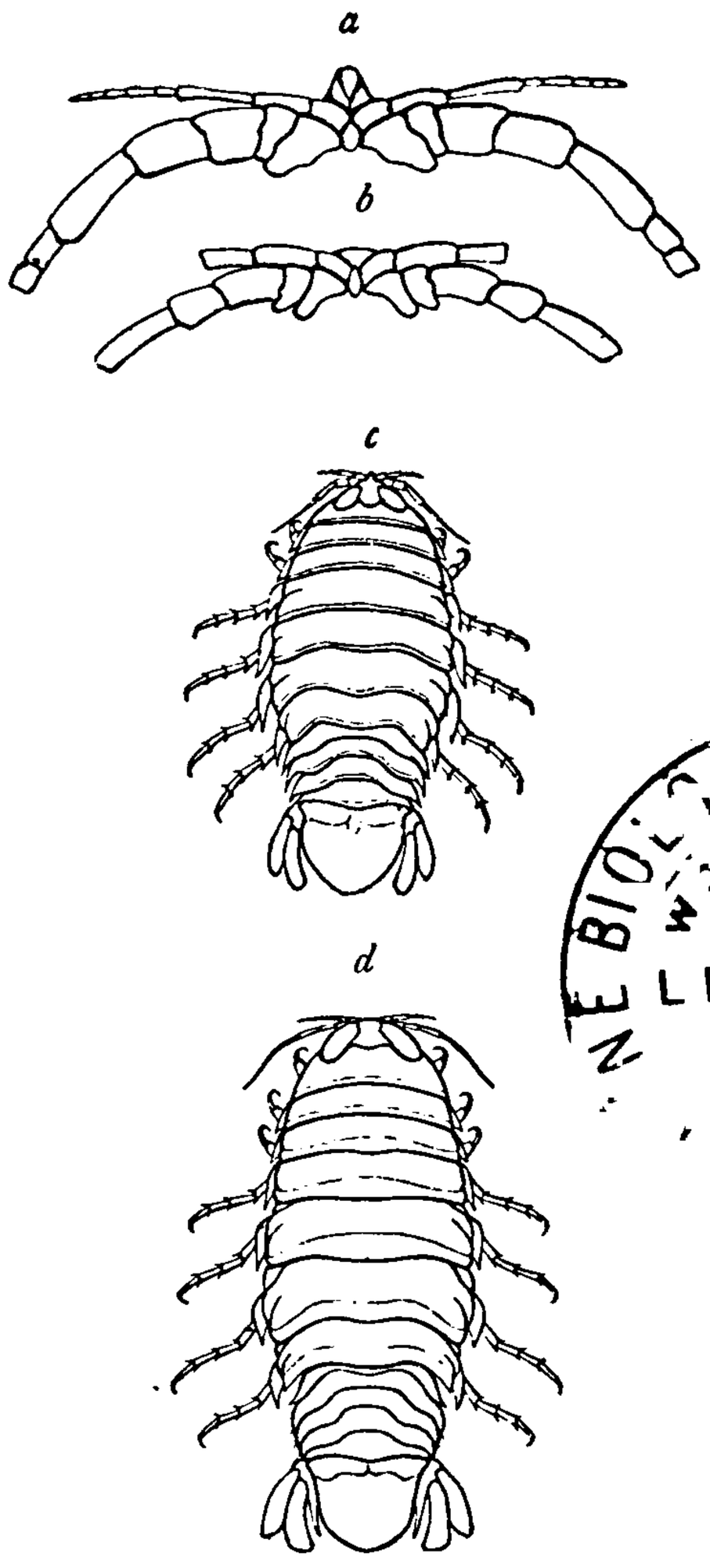


Fig. 181.—Rocinela dumerilii (after Schiœdte and Meinert). *a*, Frontal margin with both antennæ and frontal lamina of adult female. *b*, Same of young female. *c*, Adult female. *d*, Young female. (Enlarged.)

Localities.—Off Habana, Cuba; also Mediterranean Sea; Adriatic Sea; in the Atlantic Ocean, latitude 36° 47′ 7″ north, longitude 14° 7′ 2″ west; Vasco de Gama Pt. "S. 75° E., 13½ miles" (Stebbing).

Depth.—230 fathoms. Nature of bottom, fine gray sand.

Body oblong, ovate, twice as long as wide, 15 mm. : 30 mm.

Head not quite twice as wide as long 4 mm. : 7 mm., somewhat triangular in shape, with the front produced over the basal articles of

the antennæ. The eyes are large, oval, composite, and not contiguous, but separated in front by two high, conspicuous carinæ, each carina extending along the anterior edge of the eye, being somewhat divergent and divided by a median longitudinal depression. The anterior margin of the head between the eyes is three-lobed, the median lobe being slightly anterior to the other two. The first pair of antennæ have the basal article short and almost inconspicuous; the second article is almost twice as long as the first; the third is twice as long as the second. The flagellum is composed of seven articles. The first antennæ extend to the middle of the fifth article of the peduncle of the second pair of antennæ. The first two articles of the second pair of antennæ are short, the second one shorter than the first; the third and fourth are about equal in length and twice as long as the first; the fifth article is a little longer than the fourth. The flagellum is composed of fifteen articles. The second antennæ extend to the middle of the third thoracic segment. The frontal lamina is small and almost inconspicuous; it is rhomboid-shaped and ventrally placed. The maxilliped has a palp of two articles.

FIG. 182.—ROCINELA DUMERILII. LEG OF SECOND PAIR. × 9¾.

The fourth, fifth, and sixth thoracic segments are a little longer than any of the others. The epimera in all the segments from the second to the seventh inclusive are distinct and have the posterior extremities very acute, the angle being sharper in the last four. In the last three segments the epimeron is produced beyond the posterior margin of the segments. A carina extends obliquely across all the epimera.

The first segment of the abdomen is almost entirely covered by the seventh thoracic segment except at the sides. The lateral parts are not separated from the dorsal portion of the segments. The sixth or terminal segment is narrowly rounded at the extremity; its posterior margin is furnished with spines. The uropoda extend to the tip of the abdomen. The branches are equal in width, but the inner one is a little longer than the outer one. Both are furnished with spines. The peduncle extends as far as the extremity of the outer branch.

The first three pairs of legs are prehensile, the last four pairs ambulatory. In the three anterior pairs, the propodus is armed with four spines, the carpus with one, and the merus with three. The ambulatory legs are furnished with numerous spines.

ROCINELA CUBENSIS Richardson.

Rocinela cubensis RICHARDSON, Proc. Amer. Philos. Soc., XXXVII, 1898, pp. 13–14; Proc. U. S. Nat. Mus., XXIII, 1901, p. 523.

Locality.—Off Habana.

Depth.—143 fathoms.

Outline of body oval, surface smooth.

Head with rounded lateral margins. Its anterior margin is produced forward in a large rounded projection, the breadth of which is equal to its length, and the upper surface deeply concave with upturned edges. This projection extends forward for about half its length and then upward, the change in direction being gradual. Eyes large and composed of ten rows of ocelli. Two small tubercles are situated between the eyes, and in the middle of the head and back of these is an arc-shaped depression. The first antenna reaches the posterior margin of the head; its flagellum is composed of six articles. The second antenna extends to the posterior margin of the third thoracic segment; its flagellum is composed of fifteen articles.

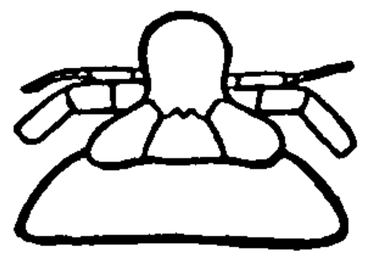


FIG. 183.—ROCINELA CUBENSIS. HEAD.

The thoracic segments are subequal in length. The epimera are long and narrow, with very acute posterior angles.

The first segment of the abdomen is almost entirely concealed by the last thoracic segment. The fifth is likewise covered at the sides by the fourth segment. The last abdominal segment is triangular in shape with a rounded posterior margin. The outer branch of the uropods is very broad and oar-shaped, with a rounded extremity. The inner branch is long and slender, of equal breadth throughout its length and rounded on its posterior margin. The inner branch is the longer one. Both are fringed with hairs.

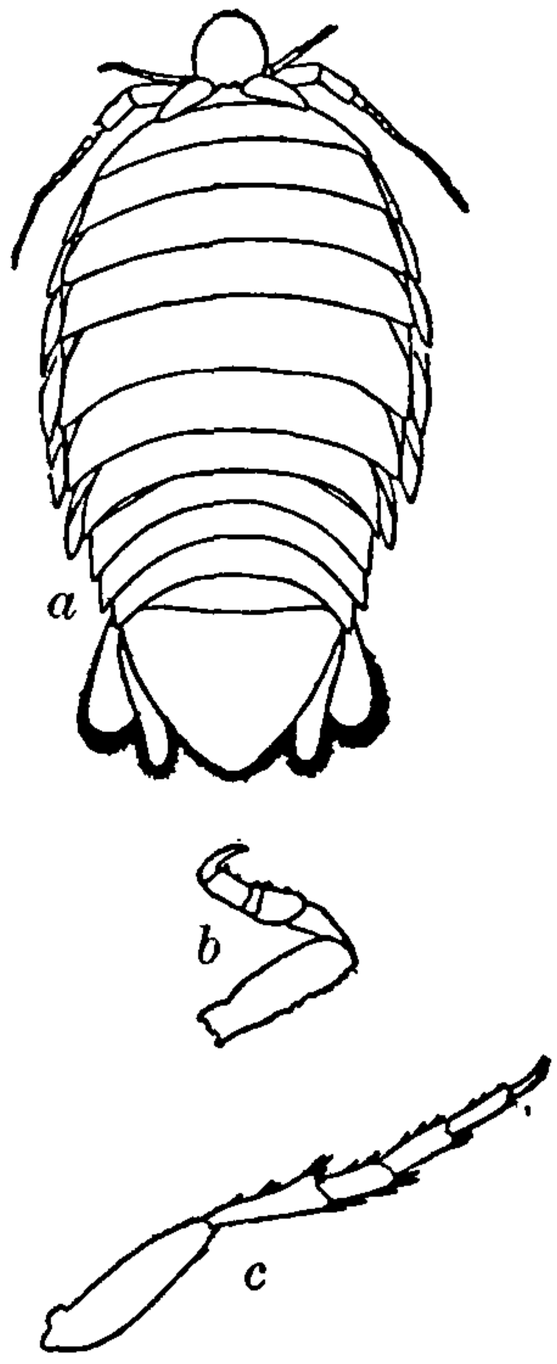


FIG. 184.—ROCINELA CUBENSIS. *a*, MALE. × 2¼. *b*, LEG OF FIRST PAIR. × 4⅓. *c*, LEG OF FOURTH PAIR. × 4⅓.

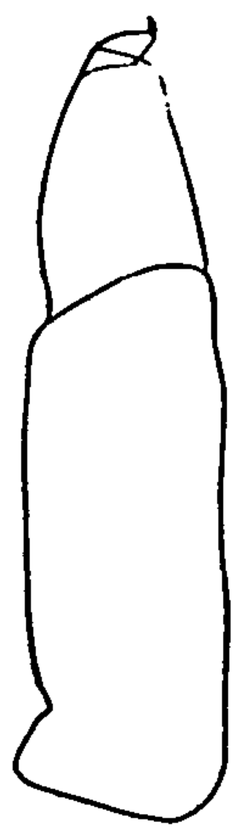


FIG. 185.—ROCINELA CUBENSIS. MAXILLIPED. × 39.

In the prehensile legs of this species the basis presents a row of tubercles on the superior margin. There are two spines on the propodus, one on the carpus, and two on the merus. The gressorial legs are but slightly spinulose.

Type.—The type specimen was found off Habana, latitude 23° 11′ north, longitude 82° 19′ 6″ west, Station 2341, 143 fathoms (U.S.N.M., Cat. No. 20087).

ROCINELA MACULATA Schiœdte and Meinert.

Rocinela maculata SCHIŒDTE and MEINERT, Naturhistorisk Tidsskrift (3), XII, 1879–80, p. 393, pl. XII, figs. 10–12.—BOVALLIUS, Bihang till Kgl. Sv. Vet. Akad. Handling., X, No. 11, 1885, p. 10, pl. II, figs. 18–23.—HANSEN, Vidensk. Meddel. naturh. Foren. i. Kjøbh., 1887, p. 187.—RICHARDSON, American Naturalist, XXXIV, 1900, p. 219; Proc. U. S. Nat. Mus., XXIII, 1901, p. 524.

Localities.—West Greenland; Vladivostok; east Asia.

Body short, ovate, punctate on the dorsal surface, with minute scattered dots; the dorsal surface of the fourth thoracic segment is ornamented on either side with an obscure subocellate spot; the last segment of the abdomen is marked at the base on either side with an obscure spot.

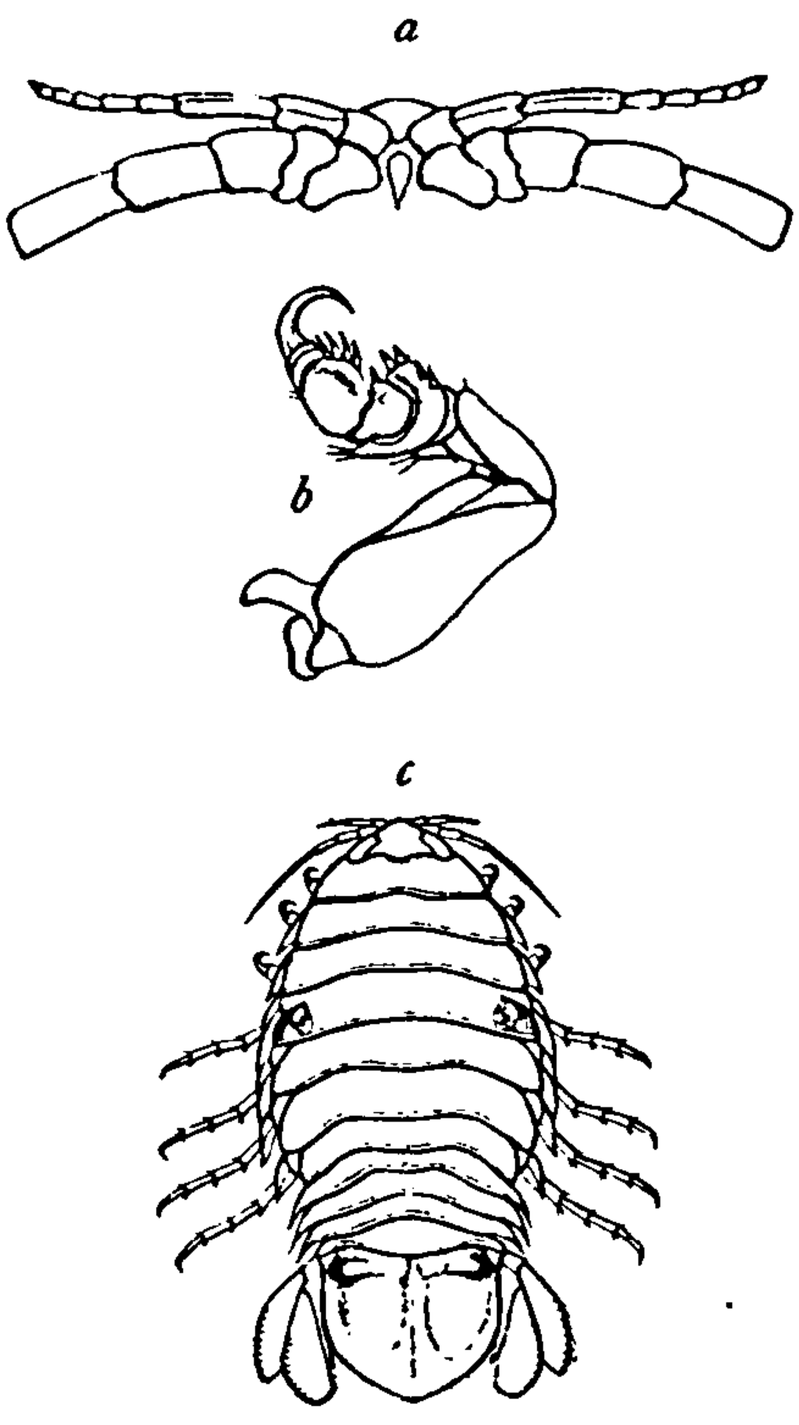


FIG. 186.—ROCINELA MACULATA (AFTER SCHIŒDTE AND MEINERT). *a*, FRONTAL MARGIN WITH BOTH ANTENNÆ AND FRONTAL LAMINA. *b*, RIGHT LEG OF SECOND PAIR. *c*, ADULT MALE. (ENLARGED.)

The front of the head is triangular, with the apex widely obtuse, smooth above.

The frontal lamina is minute, narrowly rhomboidal in shape.

The eyes are minute, pentagonal in shape, separated by a distance equal to a third part of the width of the head. The first pair of antennæ with the four last articles extend beyond the anterior angle of the first thoracic segment, reaching with the peduncle as far as a third part of the fourth article, and with the flagellum as far as the fifth article of the second pair of antennæ; the flagellum is composed of six articles, the first article being a little longer than the second, the last article being the smallest.

The second pair of antennæ extend to the end of the first epimeron; the flagellum is composed of fifteen articles.

The first segment of the thorax is slightly bisinuated anteriorly on the dorsal surface.

The epimera are rather large, and rather wide; the posterior angles of the posterior epimera are very acutely produced; the last epimeron extends two parts of the length of the second segment of the abdomen.

The prehensile legs are short; the merus is short, and armed with three or four rather stout, obtuse spines; the propodus is furnished along the edge with four long, acute spines; the ungulæ are rather large, slender, ornamented with four carinæ, somewhat incurved and subequal. The ambulatory legs are rather long, rather stout, furnished with short spines. The first segment of the abdomen is almost entirely concealed.

The last segment of the abdomen is short, lingulate, smooth above, and with two depressions at the base.

The uropoda are rather long and large; the inner branch is a little longer and wider than the outer branch and is posteriorly truncate; both branches are crenulated on the exterior margin.

Length, 23 mm.[a]

ROCINELA BELLICEPS (Stimpson).

Æga belliceps STIMPSON, Proc. Acad. Nat. Sci. Phila., XVI, 1864, p. 155.
Æga alascensis LOCKINGTON, Proc. Cal. Acad. Sci., VII, 1877, Pt. 1, p. 46.
Rocinela alascensis RICHARDSON, Proc. Am. Philos. Soc., XXXVII, 1898, p. 11.
Rocinela belliceps RICHARDSON, Proc. U. S. Nat. Mus., XXI, 1899, p. 827; Ann. Mag. Nat. Hist. (7), IV, 1899, p. 169; Amer. Naturalist, XXXIV, 1900, p. 219; Harriman Alaska Exp. Crust., X, p. 214; Proc. U. S. Nat. Mus., XXVII, 1904, p. 214; Bull. U. S. Fish Comm., XXIV, 1905, p. 213.

Localities.—Cortes Bank, California to Alaska and Bering Sea; Yakutat, Alaska; Unalga Pass, Aleutians.

Parasite of cod and sculpin; from the fish *Hydrolagus colliei*.

Depth.—5–688 fathoms. Rocky beach under stones; shelly sand, mud, and gravel; in low water; in brown and green mud, red sand.

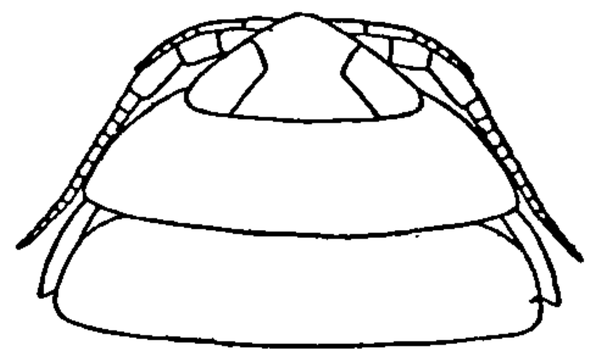


FIG. 187.—ROCINELA BELLICEPS. HEAD AND FIRST TWO THORACIC SEGMENTS. × 2⅓.

Body oblong-ovate, a little more than twice as long as wide, 10 mm.: 22 mm.

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[a] The above description is adapted from the following one of Schiœdte and Meinert's:

Breviter ovata, supra præter puncturam ordinariam punctis minutis, perraris sparsa; segmentum dorsale annuli quarti trunci utrinque macula obscura, subocellata ornatum; annulus analis ad basin utrinque macula obscura notatus.

Frons triangula, apice late obtusa, supra æquata.

Lamina frontalis minuta, anguste rhomboidalis.

Oculi minuti, pentagoni, tertia parte latitudinis capitis distantes. Antennæ primi paris articulis quaternis ultimis angulum priorem annuli primi trunci superantes, scapo tertiam partem articuli quarti, flagello articulum quintum antennarum secundi paris explentes; flagellum 6-articulatum, articulo primo quam secundo paulo longiore, articulo ultimo minimo.

Antennæ secundi paris epimerum primum explentes; flagellum 15-articulatum. Segmentum dorsale annuli primi trunci ante leviter bisinuatum.

Epimera majuscula, latiuscula; anguli postici epimerorum posteriorum acuti, valde producti; epimerum ultimum duas partes annuli secundi caudalis explens.

Pedes prensorii breves: femora brevia, aculeis ternis quaternisve crassiusculis, obtusis armata; tarsi in acie aculeis quaternis longis, acutis instructi; ungulæ majusculæ, gracilis, quadricarinatæ, admodum incurvæ, inter se subæquales. Pedes gressorii longiusculi crassiusculi, breviter spinulosi. Annulus primus caudalis fere totus obtectus.

Annulus analis breviter lingulatus, supra subæquatus, ad basin bis impressus.

Pedes anales longiusculi, magni; ramus interior quam exterior paulo longior atque latior, post truncatus; ramus uterque in latere exteriore crenulatus.

Long. 23 mm.—SCHIŒDTE AND MEINERT, Nat. Tidsskr. (3), XII, 1879–80, p. 393.

Head somewhat triangular in shape, one and two-thirds times wider than long, 3 mm. : 5 mm. Front of head obtusely produced over the basal articles of the antennæ, partly concealing these articles. The eyes are large, oval, composite, situated in the post-lateral angles of the head and extending along the side a little beyond the middle of the lateral margin. They are separated anteriorly by a distance equal to

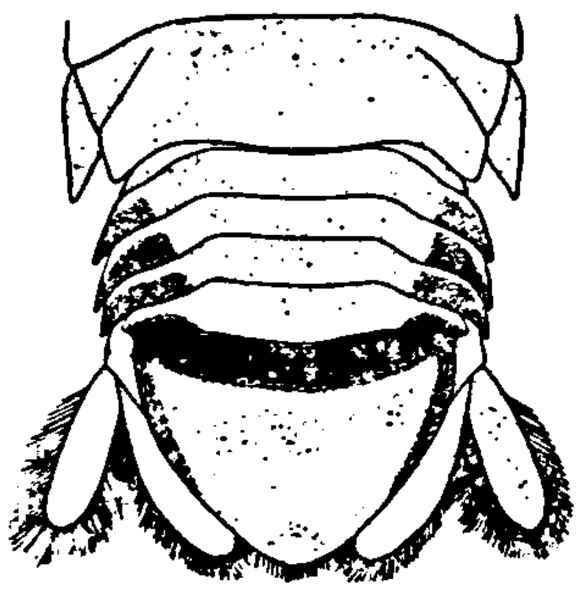


FIG. 188.—ROCINELA BELLICEPS. ABDOMEN AND L ST THORACIC SEGMENT. × 2⅓.

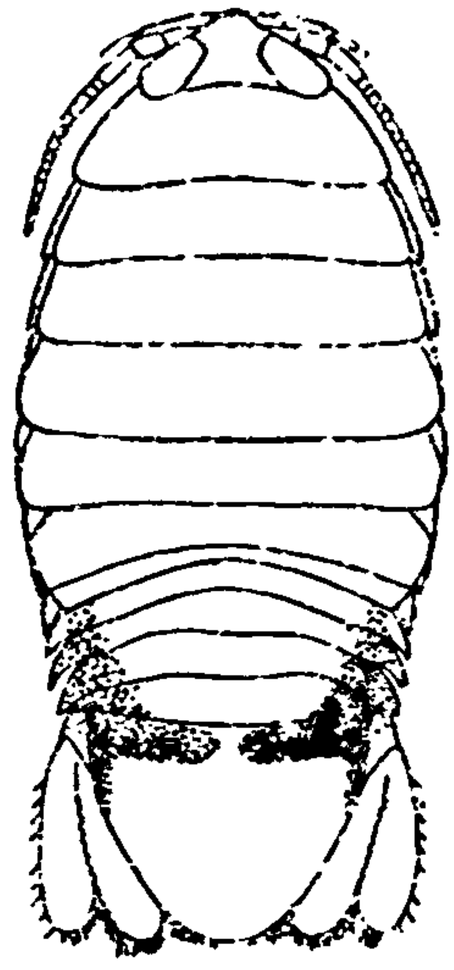


FIG. 189.—ROCINELA BELLICEPS.

FIG. 190.—ROCINELA BELLICEPS. MAXILLIPED. × 27½.

one-third the width of the head at the base. The basal article of the first antennæ is almost entirely concealed by the front of the head; the second article is short; the third is one and a half times longer than the second. The flagellum is composed of four articles. The first antennæ extend almost to the posterior margin of the head. The second pair of antennæ have the first two articles short, the second one a little shorter than the first; the third and fourth are subequal and each is about twice as long as the first; the fifth is about one and a half times as long as the fourth. The flagellum is composed of fourteen articles. The second antennæ extend to the posterior margin of the second thoracic segment. Frontal lamina very small, minute, rhomboid-shaped at its base and ventrally placed. The maxilliped has a palp of two articles.

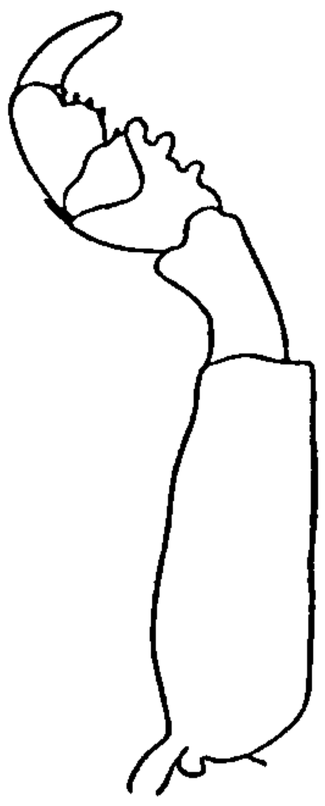


FIG. 191.—ROCINELA BELLICEPS. LEG OF THIRD PAIR. × 7.

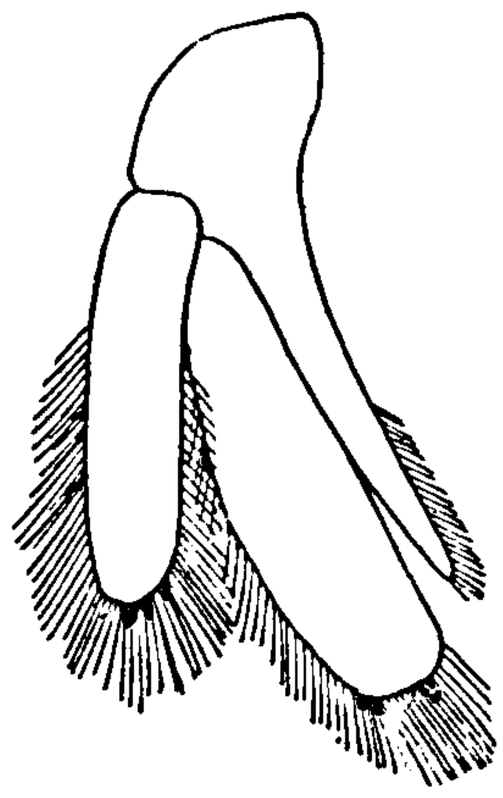


FIG. 192.—ROCINELA BELLICEPS. UROPOD. × 6½.

The first segment of the thorax is a little longer than any of the others; the second, third, and fourth are subequal; the fifth, sixth, and seventh are progressively shorter, the seventh being only half as long as the sixth. The epimera of all the segments are distinct with the exception of the first. The posterior extremities of the first three

are round; those of the last three are acute. A faint carina crosses the epimera obliquely.

The first segment of the abdomen is entirely concealed by the last thoracic segment, so that there is no trace of it whatever on the dorsal side. The lateral parts of the segments are not distinct from the dorsal portion. The last segment is widely rounded posteriorly with margin faintly crenulate. The uropoda are alike in shape, being long and narrow with posterior margins rounded, oar-like; the inner branch is a little longer than the outer branch and does not extend beyond the extremity of the terminal abdominal segment; the branches are equally wide. The basal segment of the uropoda extends as far as the end of the outer branch, and nearly to the end of the inner branch.

The first three pairs of legs are prehensile; the last four pairs ambulatory. There are three spines on the merus and three on the propodus of the first three pairs of legs.

The lateral parts of the second, third, fourth, and fifth segments of the abdomen and the base of the sixth or terminal segment are marked with black.

ROCINELA AMERICANA Schiœdte and Meinert.

Rocinela americana SCHIŒDTE and MEINERT, Naturhistorisk Tidsskrift (3), XII, 1879–1880, pp. 394–395, pl. XII, figs. 16–18.—HARGER, Bull. Museum Comp. Zool., Harvard College, XI, 1883, No. 4, pp. 98–99, pl. IV, figs. 3, 3a, 4; pl. IV, figs. 2–2a.—RICHARDSON, American Naturalist, XXXIV, 1900, p. 219; Proc. U. S. Nat. Mus., XXIII, 1901, p. 524.

Localities.—Trenton, Maine; latitude 40° 2′ 54″ north, longitude 70° 23′ 40″ west; latitude 40° north, longitude 70° 57′ west; latitude 39° 57′ north, longitude 70° 57′ 30″ west; latitude 37° 25′ north, longitude 74° 18′ west; latitude 40° 2′ north, longitude 70° 37′ 30″ west.

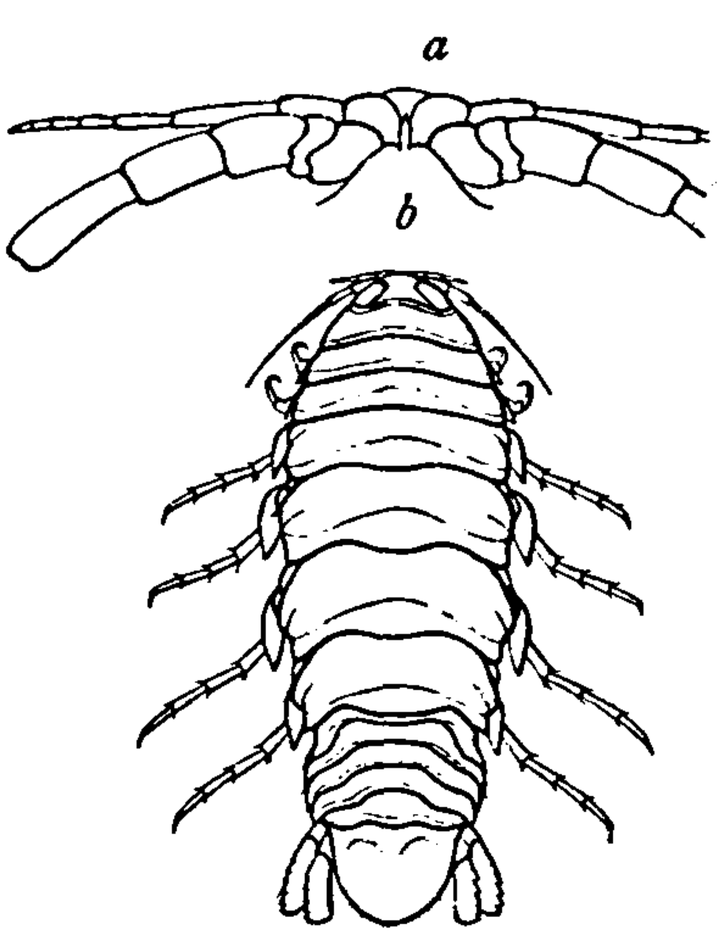


FIG. 193.—ROCINELA AMERICANA (AFTER SCHIŒDTE AND MEINERT). *a*, FRONTAL MARGIN WITH BOTH ANTENNÆ AND FRONTAL LAMINA. *b*, YOUNG FEMALE. (ENLARGED.)

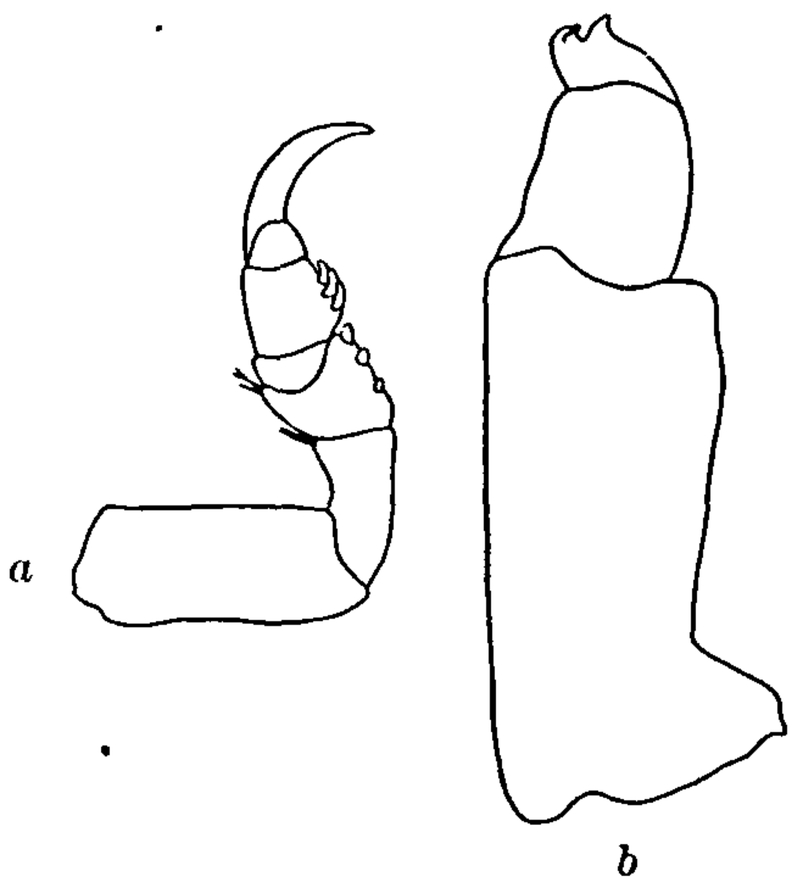


FIG. 194.—ROCINELA AMERICANA. *a*, SECOND LEG. × 11½. *b*, MAXILLIPED. × 39.

Depth. — 85–157 fathoms.

Body ovate, a little more than twice as long as broad, 9 mm. : 20 mm.

Head twice as wide as long, 2 mm. : 4 mm.; triangular in shape, with the front produced over the basal articles of the antennæ. Eyes

large, oval, composite, separated in front by a distance nearly equal to the width of one eye. Basal article of the first pair of antennæ short and nearly concealed by the front of the head; second article twice as long as the basal article; third article twice as long as the second one. Flagellum is composed of six articles. The first antennæ extend to the end of the peduncle of the second pair of antennæ or to the antero-lateral angle of the first thoracic segment. The first two articles of the second pair of antennæ are short, the second shorter than the first; the third is twice as long as the first; the fourth is equal in length to the third; the fifth is one and a half times longer than the fourth. The flagellum is composed of fourteen to fifteen articles. The second antennæ extend to the posterior margin of the second thoracic segment. The frontal lamina is small, almost inconspicuous, rhomboid-shaped at the base, which is ventrally placed. The maxilliped has a palp of two articles.

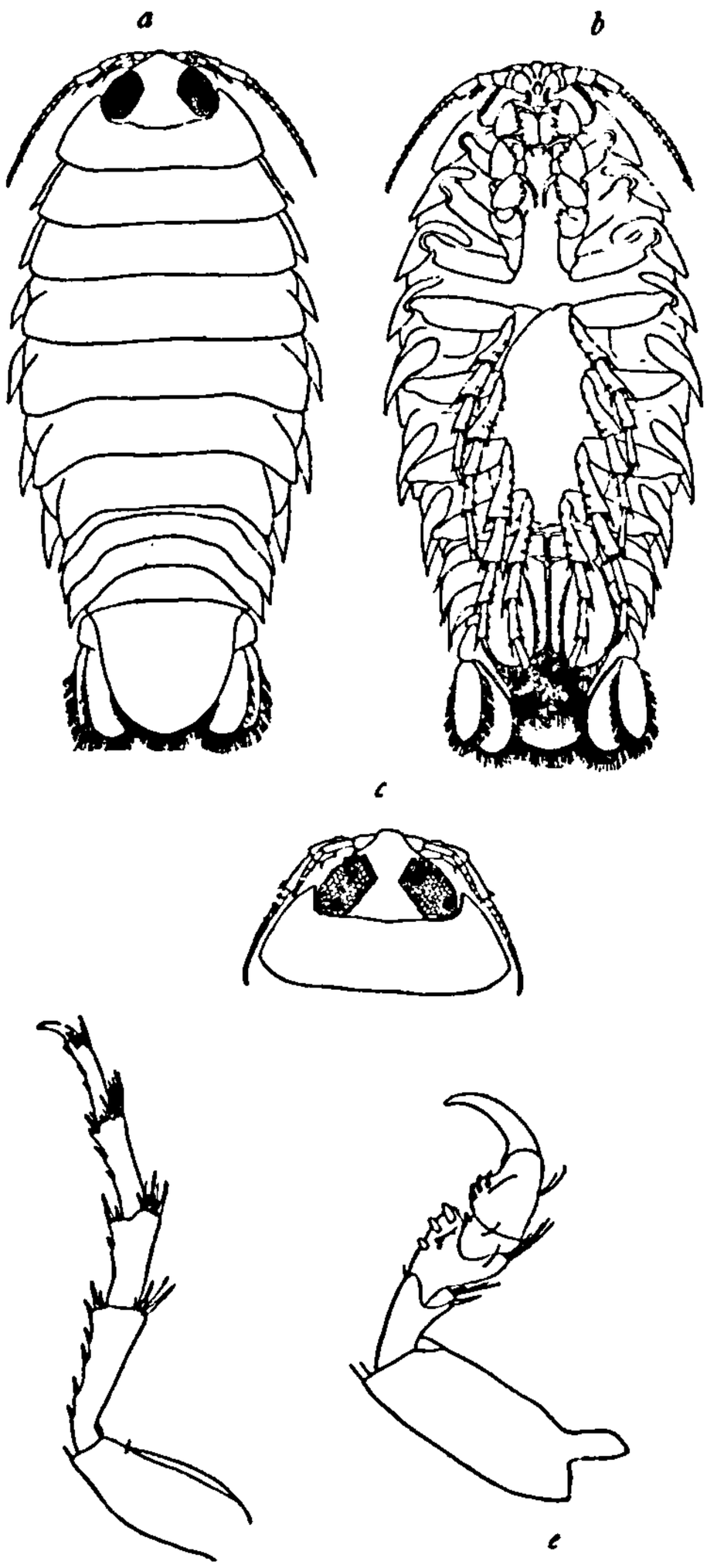


FIG. 195.—ROCINELA AMERICANA (AFTER HARGER). *a*, DORSAL VIEW OF FEMALE. × 2. *b*, VENTRAL VIEW OF FEMALE. × 2. *c*, HEAD AND FIRST THORACIC SEGMENT OF MALE. × 2. *d*, LEG OF SIXTH PAIR. × 6⅔. *e*, LEG OF FIRST PAIR. × 6⅔.

The first segment of the thorax is a little longer than the others. The epimera are distinct from the segments in all but the first segment; they are narrow plates with the posterior extremity very acute in the last four. The epimeron of the seventh segment is produced beyond the posterior margin of the segment. A distinct carina obliquely crosses all the epimera.

The first segment of the abdomen is almost entirely concealed by the seventh thoracic segment. The lateral parts of the abdominal segments are not separated off from the dorsal portion. The sixth or terminal segment is rounded posteriorly. The inner branch of the uropoda is longer than the outer branch and a little wider. It does not extend beyond the extremity of the terminal abdominal segment. The peduncle extends as far as the tip of the outer branch. Both branches are rounded posteriorly. Uropoda and terminal abdominal segment furnished with spines along the margins.

Legs of the first three pairs prehensile; those of the last four pairs ambulatory. There are three spines on the propodus and three on the merus of all three anterior pairs.

ROCINELA PROPODIALIS Richardson.

Rocinela propodialis RICHARDSON, Bull. U. S. Fish Comm., XXIV, 1905, pp. 214–215.

Locality.—Admiralty Inlet, vicinity of Port Townsend.
Depth.—15–26 fathoms.

Body nearly twice as long as wide. Color brown, with small black dots.

Head triangular and produced in front in a broad median process. Eyes large and separated in front by a distance equal to the length of one eye. The first pair of antennæ extend to the posterior margin of the head or to the end of the peduncle of the second pair; the flagel-

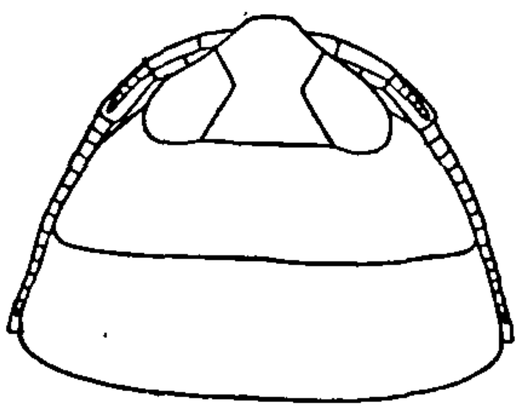


FIG. 196.—ROCINELA PROPODIALIS. HEAD WITH ANTENNÆ AND FIRST TWO THORACIC SEGMENTS. × 2⅓.

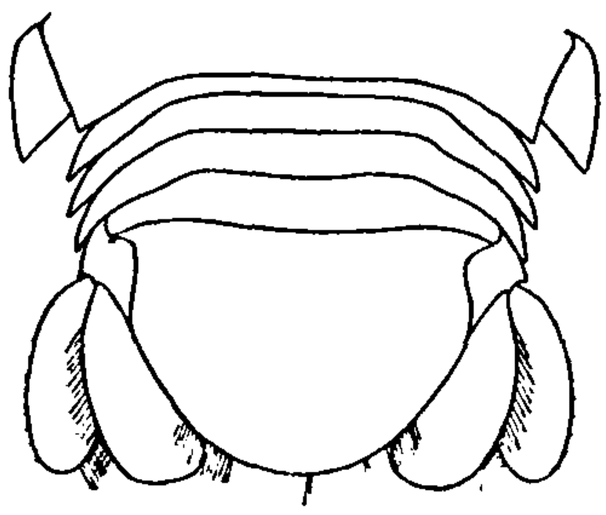


FIG. 197.—ROCINELA PROPODIALIS. ABDOMEN. × 2⅓.

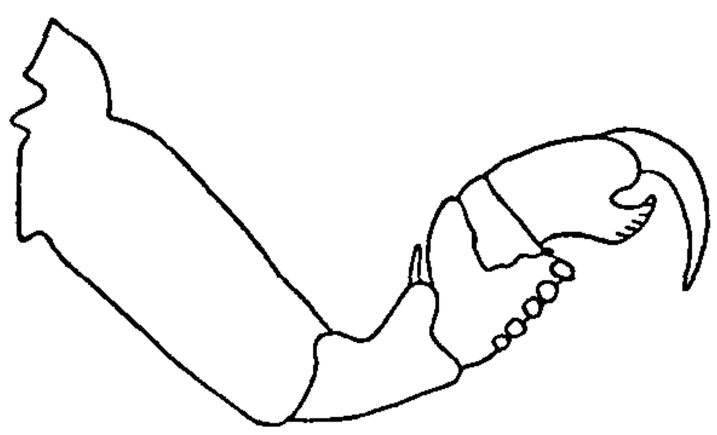


FIG. 198.—ROCINELA PROPODIALIS. THIRD LEG. × 7.

lum has four to six joints. The second pair of antennæ reach the posterior margin of the second thoracic segment; the flagellum has sixteen joints.

The several segments of the thorax are about equal in length, the first segment being a little longer and the last a little shorter than the others. The epimera of all the segments are produced at the outer posterior angle, becoming more and more pointed in the last four segments. The epimera of the last segment only project beyond the posterior margin of the segment.

The first segment of the abdomen is entirely concealed by the last thoracic segment. The fifth is narrower than the preceding ones, but longer in the median line. The terminal abdominal segment is linguiform, rounded posteriorly, with smooth margins furnished with short hairs. The uropoda do not exceed in length the terminal abdominal segment. The outer branch is somewhat narrower and shorter than the inner, and both branches are armed with a few short spines along the outer margins and with long hairs along the inner margins.

The first three pairs of legs have the propodus armed with a process, the edge of which is denticulate with six teeth meeting squarely and without interval, forming an unbroken line; the carpus is armed with one inconspicuous spine; the merus has five short blunt spines along the inner margin and the ischium is furnished with one long spine at the outer distal angle. The last four pairs of legs are armed with numerous spines.

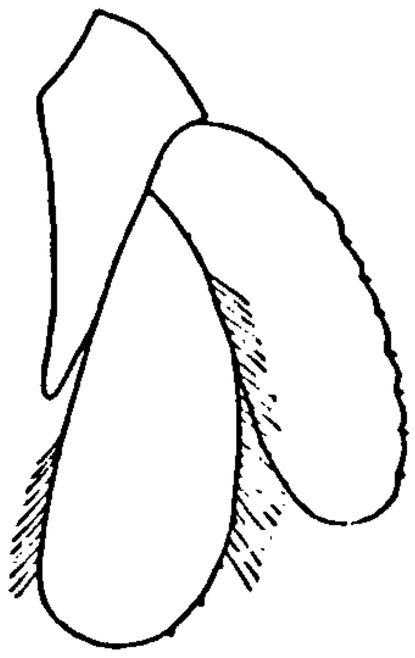


FIG. 199.—ROCINELA PROPODIALIS. UROPOD. × 6½.

Only one specimen, a male and the type (Cat. No. 29248 U.S.N.M.), was taken by the U. S. Bureau of Fisheries steamer *Albatross*, at station 4205, Admiralty Inlet, vicinity of Port Townsend.

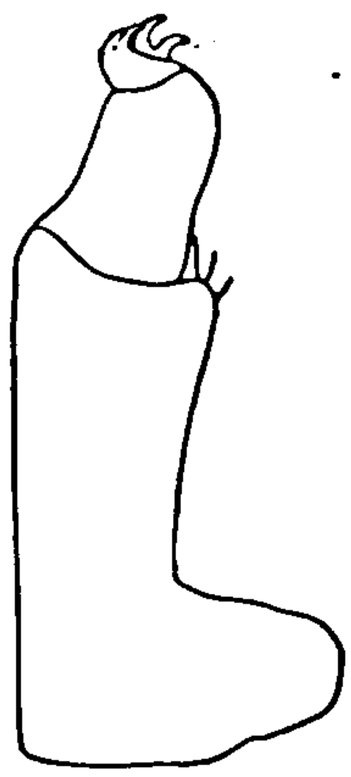


FIG. 200.—ROCINELA PROPODIALIS. MAXILLIPED. × 20¼.

This species differs from *R. angustata*[a] Richardson, which it closely resembles, in the denticulate process arming the propodus of the first three pairs of legs, with six contiguous teeth meeting squarely along the edge, while in *R. angustata* the propodus is armed with four long spines; in having the merus of these legs armed with five blunt spines instead of four long ones; in having the outer branch of the uropoda a little shorter and narrower than the inner branch instead of almost twice as wide; and in having the frontal process wider and the distance between the eyes in front greater than in *R. angustata*.

ROCINELA LATICAUDA Hansen.

Rocinela laticauda HANSEN, Bull. Mus. Comp. Zool., Harvard College, XXXI, 1897, No. 5, pp. 108–109.—RICHARDSON, Proc. U. S. Nat. Mus., XXI, 1899, p. 828 (part); Ann. Mag. Nat. Hist. (7), IV, 1899, p. 169 (part).

Localities.—Off Acapulco; near Tres Marias Islands; off Mazatlan.

Body oblong-ovate, two and a half times longer than wide, 16 mm.: 40 mm.

Head wider than long, 4 mm.: 7 mm., triangular in shape, with a median process in front which has a blunt or truncate extremity. The eyes are large, oval, composite, and situated at the sides of the head, and separated anteriorly by a distance equal to 2 mm. The first pair of antennæ have the first two articles short and subequal, the first article being almost entirely concealed dorsally by the frontal process; the third article is twice as long as the second. The flagellum is composed of six articles. The first antennæ extend to the middle of the fifth article of the peduncle of the second pair of antennæ. The second pair of antennæ have the first two articles short and subequal; the third and fourth are also subequal and each is about three times as long

[a] Proc. U. S. Nat. Mus., XXVII, 1904, p. 33.

as the second; the fifth is one and a half times longer than the fourth. The flagellum is composed of sixteen articles. The second antennæ extend to the middle of the third thoracic segment. The palp of the maxillipeds is composed of two articles.

The segments of the thorax are subequal in length, each being 3 mm. long, with the exception of the first, which is 4 mm. The epimera are distinctly separated on all the segments with the exception of the first. Those of the second and third segments have the posterior extremities rounded; those of the last four segments have the posterior extremities acutely pointed, and the last three are produced beyond the posterior margins of the segments.

The first segment of the abdomen is entirely concealed by the seventh thoracic segment. The remaining five segments are distinct. The sixth or terminal segment is broader than long, 14 mm.: 12 mm. It is 14 mm. wide at the base and also 14 mm. wide about the middle of the segment. The posterior etremity is widely rounded. The uropoda extend to the extremity of the terminal abdominal segment. Both branches are equal in length and are rounded posteriorly. The outer branch is one and a half times as wide as the inner branch. The peduncle of the uropoda has the inner angle produced, and this process extends a little beyond the middle of the terminal segment of the abdomen.

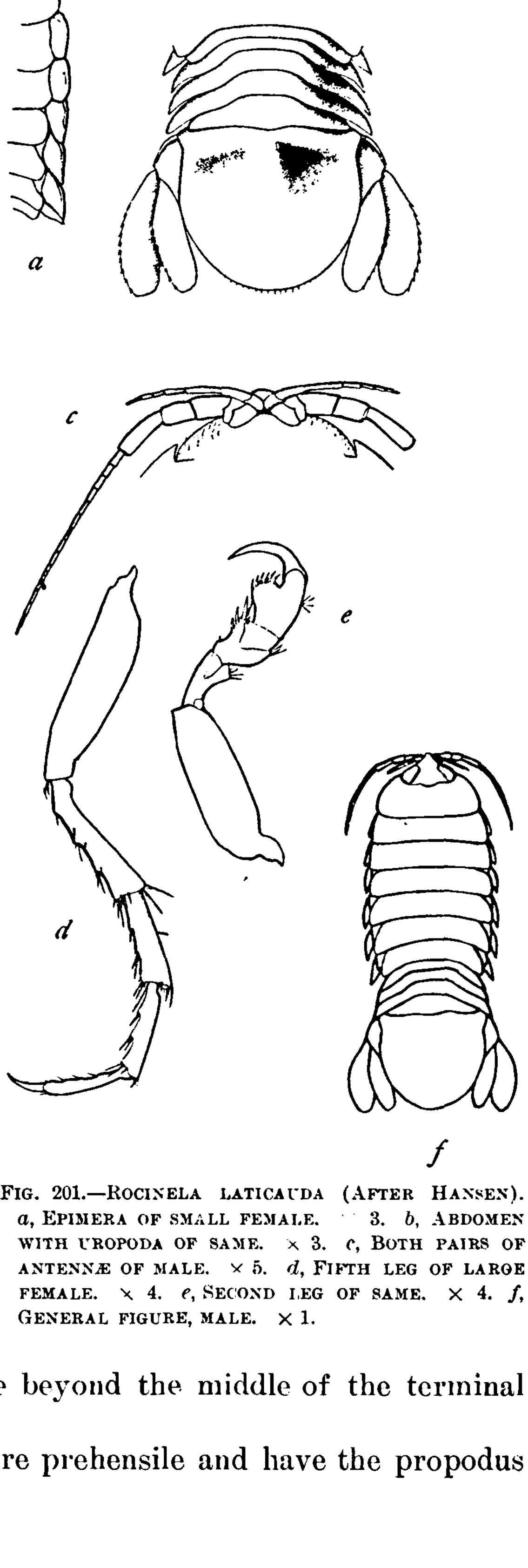


FIG. 201.—ROCINELA LATICAUDA (AFTER HANSEN). *a*, EPIMERA OF SMALL FEMALE. × 3. *b*, ABDOMEN WITH UROPODA OF SAME. × 3. *c*, BOTH PAIRS OF ANTENNÆ OF MALE. × 5. *d*, FIFTH LEG OF LARGE FEMALE. × 4. *e*, SECOND LEG OF SAME. × 4. *f*, GENERAL FIGURE, MALE. × 1.

The first three pairs of legs are prehensile and have the propodus

dus armed with five spines in the larger specimen, six in the smaller specimen, the merus with four spines. The four following pairs of legs are ambulatory and are thickly beset with spines."

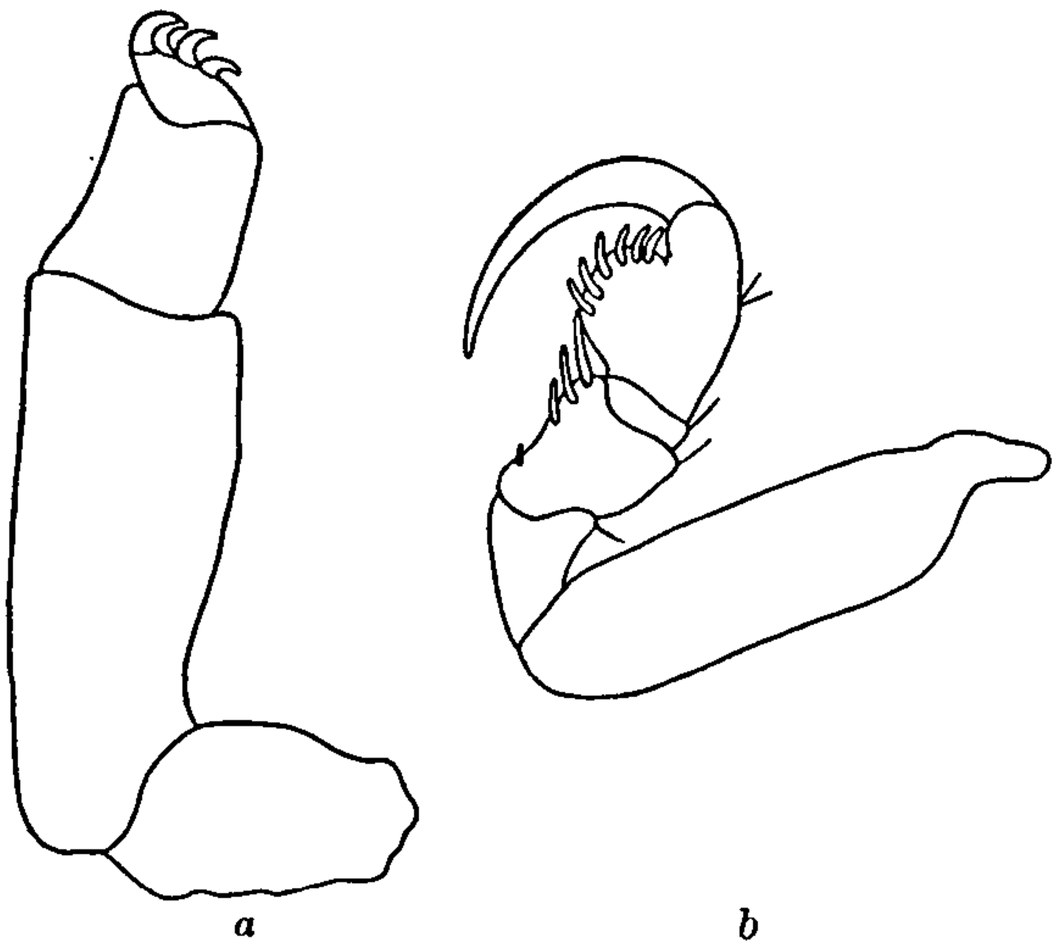


FIG. 202.—ROCINELA LATICAUDA. *a*, MAXILLIPED. × 27⅓. *b*, LEG OF SECOND PAIR. × 9⅓.

ROCINELA ANGUSTATA Richardson.

Rocinela laticauda RICHARDSON (not Hansen), Proc. Am. Philos. Soc., XXXVII, 1898, pp. 14–15, figs. 5–6; Proc. U. S. Nat. Mus., XXI, 1899, p. 828 (part); Proc. U. S. Nat. Mus., XXVII, 1904, p. 33; Bull. U. S. Fish Comm., XXIV, 1905, p. 214.

Localities.—Off San Luis Obispo Bay, California; off Esteros Bay, California; Puget Sound, Washington; Unimak Island, Alaska; Japan; Eastern Passage (vicinity of Stikine River Delta), southeastern Alaska; vicinity of Yes Bay, Behm Canal.

Depth.—67–252 fathoms.

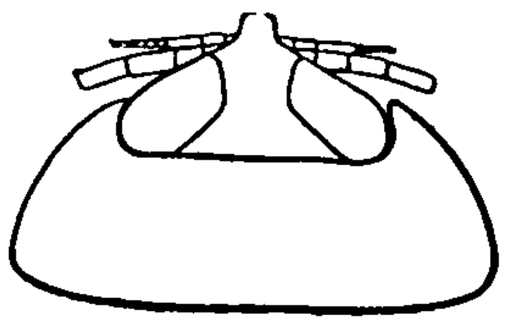


FIG. 203.—ROCINELA ANGUSTATA. HEAD. × 2⅕.

Head, with a median projection, long and broad, extending slightly downward and having a blunt extremity. Eyes large, with ten rows of ocelli. The first antenna, with a flagellum composed of six articles, reaches the posterior margin of the head. The second antenna extends to the middle of the second thoracic segment; its flagellum consists of fifteen articles.

The thoracic segments are equal in length. The first is deeply bisinuated, its antero-lateral angles extending along the side of the head to about the middle of the eyes. The epimera of the second, third, and fourth segments are rounded posteriorly; those of the remaining segments have pointed extremities.

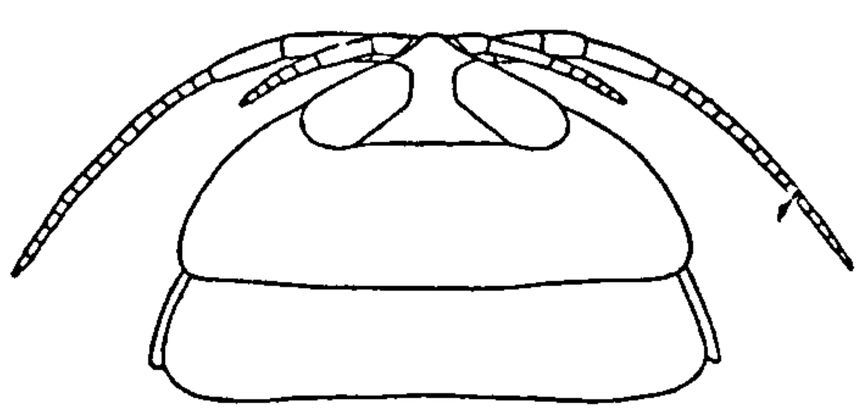


FIG. 204.—ROCINELA ANGUSTATA. HEAD WITH ANTENNÆ AND FIRST TWO SEGMENTS OF THORAX. × 1¾. (FROM JAPAN.)

The first segment of the abdomen is almost entirely covered by the last thoracic segment. The fifth segment, as well as this one, is narrower than the intervening segments, and not as broad as the base of the terminal segment. The last segment is 9 mm. wide and 7½ mm. long, widely rounded posteriorly, and is fringed with rough hairs, which almost conceal its crenulated margin; at the base it is impressed

"The measurements are of the larger specimen. The drawings are made from the smaller specimen.

on either side of a keeled center; the outer branch of the uropods is almost twice as broad as the inner branch; they are about equal in length. Both are fringed with hairs and indistinctly crenulate.

The prehensile legs are stout and short. There are four spines on the propodus and six on the merus, besides numerous hairs. The gressorial legs are likewise stout and furnished with spines and hairs.

The specimen described came from Alaska, off Unimak Island, station 3225, 85 fathoms (Cat. No. 20088, U.S.N.M.).

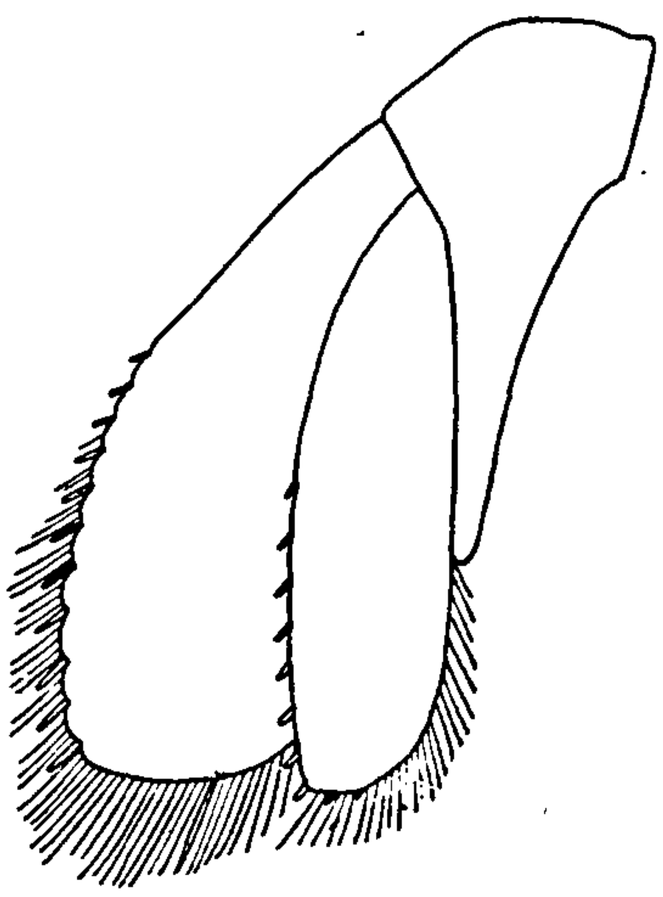
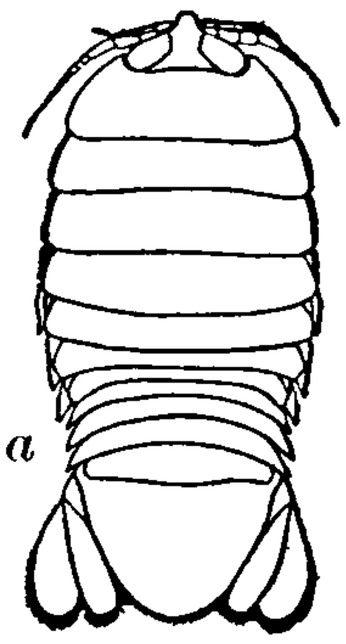


FIG. 205.—ROCINELA ANGUSTATA. UROPOD. × 6½. (FROM JAPAN.)

Distribution. — One specimen was found off San Luis Obispo Bay, California, station 3195, 252 fathoms; one off Esteros Bay, California, station 3194, 92 fathoms, and another at Puget Sound, Washington, station 3067, 82 fathoms.



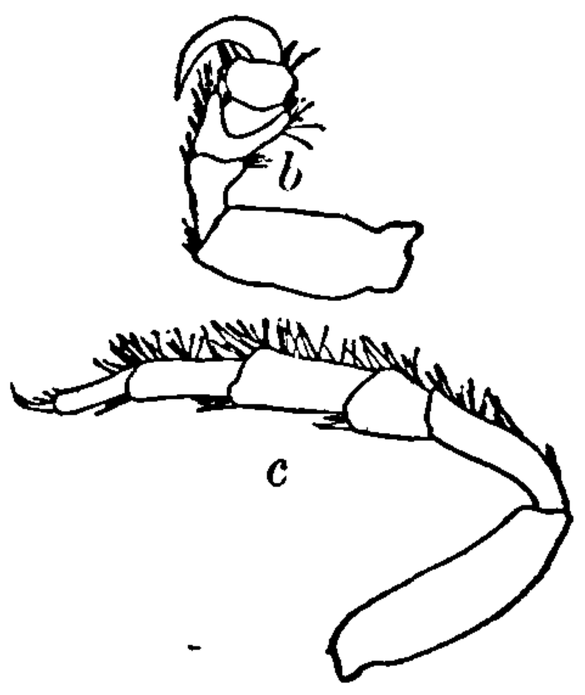


FIG. 206.—ROCINELA ANGUSTATA. *a*, MALE, SLIGHTLY REDUCED. *b*, LEG OF FIRST PAIR. × 4. *c*, LEG OF FOURTH PAIR. × 4.

The specimens from the coast of California are smaller in size and of very much lighter color than the other specimens. They are similar in other respects.

FIG. 207.—ROCINELA ANGUSTATA. THIRD LEG. × 7. (FROM JAPAN.)

A specimen from Japan, one from Esteros Bay, and one from San Luis Obispo Bay, California, have four spines on the merus of the prehensile legs.

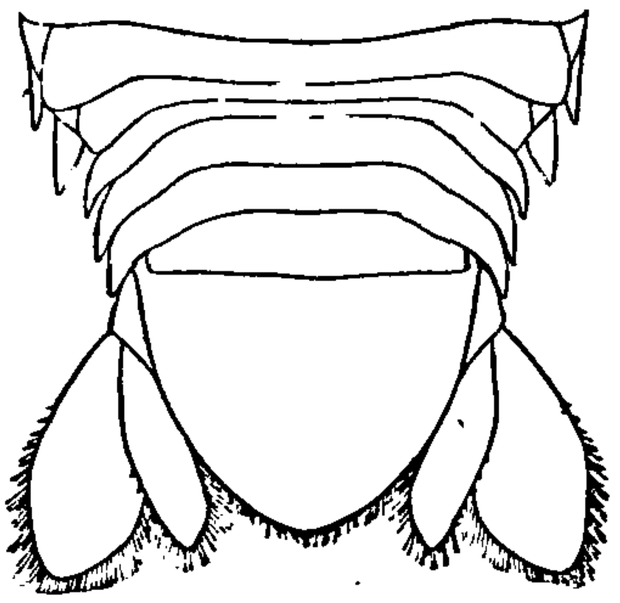


FIG. 208.—ROCINELA ANGUSTATA. ABDOMEN AND LAST THORACIC SEGMENT. × 1¾. (FROM JAPAN.)

This species differs from *R. modesta* Hansen in the larger eyes, which are also closer together than in that species, the differently shaped head and the wider outer branch of the uropoda.

ROCINELA TUBERCULOSA Richardson.

Rocinela tuberculosa RICHARDSON, Proc. Am. Philos. Soc., XXXVII, 1898, p. 16, fig. 10; Proc. U. S. Nat. Mus., XXI, 1899, p. 828; Ann. Mag. Nat. Hist. (7), IV, 1899, p. 170.

Locality.—Southern part of Gulf of California.

Depth.—8–10 fathoms.

Surface of body punctate and marked with small black dots. The posterior margin of each of the thoracic and abdominal segments is lined with a row of tiny tubercles, above which is a row of small black dots.

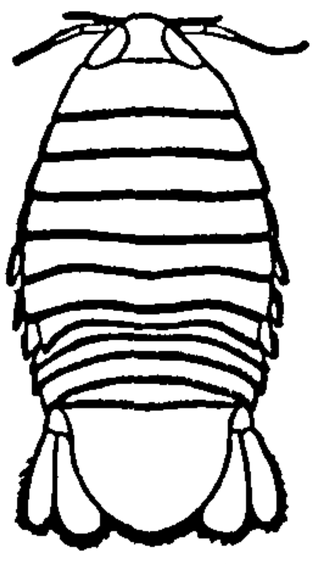
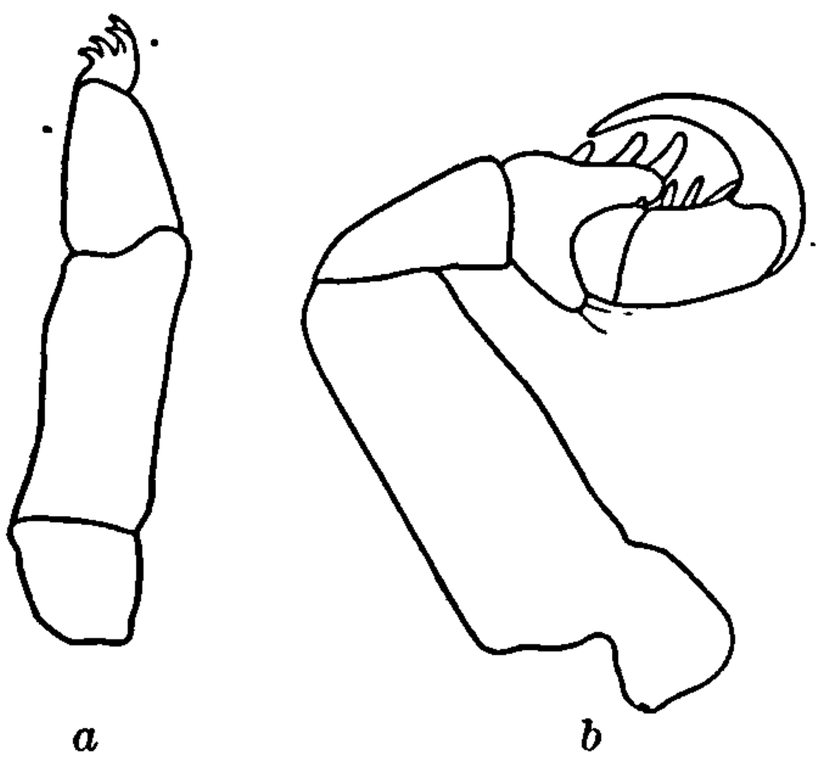


FIG. 209.—ROCINELA TUBERCULOSA. MALE. × 2⅓.

Head subtriangular, rounded in front. Eyes large and situated at a distance of one-third of the head apart. The first antenna, with a flagellum of five articles, reaches the posterior margin of the head; the second antenna extends to the posterior margin of the second thoracic segment; its flagellum is composed of eleven articles.

The posterior margin of all the thoracic segments is edged with a row of small tubercles. The epimera are narrow, those of the second, third and fourth segments being rounded at the tip, while those of the last three segments are more acute.

The first abdominal segment is entirely concealed by the last thoracic segment. The second, third, fourth and fifth segments are likewise edged with a row of small tubercles. The last segment is widely rounded. The outer branch of the uropods is somewhat narrower and shorter than the inner one and is rounded at its extremity. The inner one is bluntly rounded. Both are fringed with hairs, and on their exterior margins are armed with spines. The prehensile legs have three long, stout spines on the merus, one on the carpus, and three on the propodus. The gressorial legs are covered with spines.



a *b*

FIG. 210.—ROCINELA TUBERCULOSA. *a*, MAXILLIPED. × 27½. *b*, SECOND LEG. × 15½.

Two individuals of this species were found in the southern part of the Gulf of California, at station 2824, eight fathoms, type (Cat. No. 20652, U.S.N.M.), and station 2828, ten fathoms.

ROCINELA SIGNATA Schiœdte and Meinert.

Rocinela signata SCHIŒDTE and MEINERT, Naturhistorisk Tidsskrift (3), XII, 1879–80, pp. 399–401, pl. XIII, figs. 3–6.—RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 524.—MOORE, Bull. U. S. Fish Comm., XX, Pt. 2, 1902, p. 171, pl. x, fig. 2.

Localities.—West Indies; shores of Central America; St. Croix Island; St. Bartholomew Island; Marco and No Name Key, Florida; between delta of the Mississippi and Cedar Keys, Florida; Key West, Florida; Anclote section; Gulf of Mexico; Culebra, Porto Rico.

Depth.—2–26 fathoms.

Found in coarse sand and coral; in rocks. From back of grouper; off fish *Diplectrum formosum;* in the gills of *Thunnus alatunga;* in gills of a scaroid; on "*Hæmulon* or *Sciæna*" (Schiœdte and Meinert).

Body oblong-ovate, a little more than twice as long as wide, 6 mm.:13 mm.

Head twice as wide as long, 2 mm.:4 mm., triangular in shape and produced in front over the basal articles of the antennæ. Eyes large, oval, composite, separated in front by a distance somewhat greater than the width of one eye. The first pair of antennæ have the basal article short, and covered by the front of the head; second article about twice as long as the first; third article about one and a half times as long as the second. The flagellum is composed of four articles. The first pair of antennæ extend to the middle of the fifth article of the peduncle of the second antennæ. The first two articles of the second antennæ are short, the second one being somewhat shorter than the first; the third and fourth are subequal and each is twice as long as the first; the fifth is a little longer than the fourth. The flagellum is composed of twelve articles. The second antennæ extend almost, but not quite, to the posterior margin of the second thoracic segment. The frontal lamina is small, almost inconspicuous, rhomboid-shaped and ventrally placed. The maxilliped has a palp of two articles.

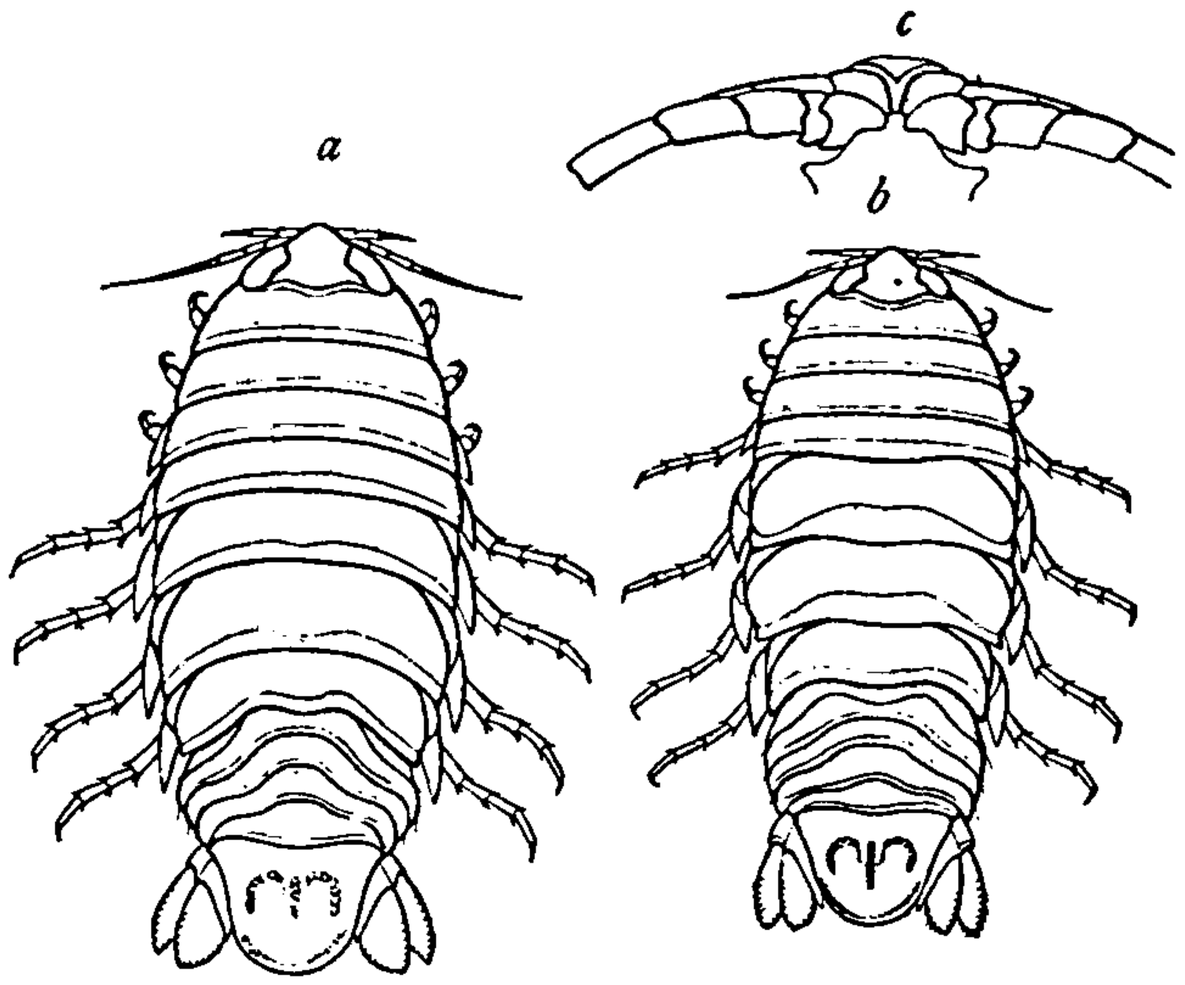
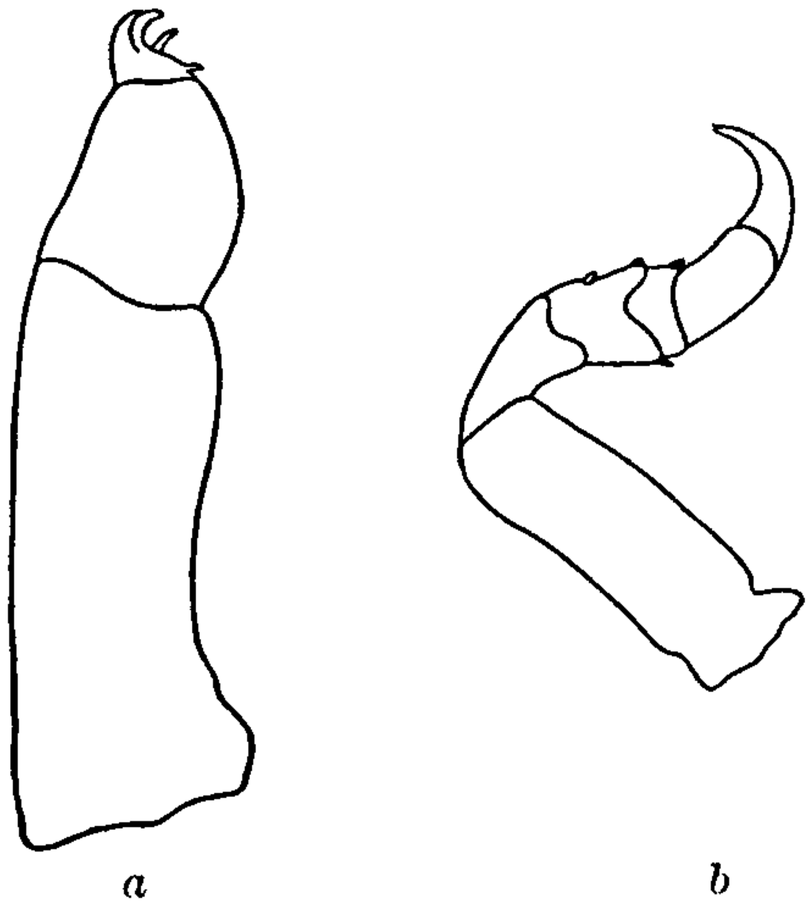


FIG. 211.—ROCINELA SIGNATA (AFTER SCHIŒDTE AND MEINERT). *a*, ADULT FEMALE. *b*, YOUNG FEMALE. *c*, FRONTAL MARGIN WITH BOTH ANTENNÆ AND FRONTAL LAMINA. (ENLARGED.)

The first, fourth, fifth, and sixth segments of the thorax are a little longer than any of the others. The epimera are distinct from the segments in all but the first. They are narrow plates, with the posterior

extremity very acute in the last four. The seventh epimeron is produced beyond the posterior margin of the segment.

The first segment of the abdomen is almost entirely concealed by the seventh thoracic segment. The lateral parts of the segments are not distinct from the dorsal portion. The sixth or terminal segment is rounded posteriorly and furnished with short spines. At the base of the terminal segment is a short median longitudinal black line, with two much shorter lines, one on either side, all connected at the base. On either side of this group of three longitudinal lines, and connected with the lateral lines, is a line which runs obliquely for some distance and then extends in a longitudinal direction for a short distance. The lines are distinctly marked, but very narrow.



a *b*

FIG. 212.—ROCINELA SIGNATA. *a*, MAXILLIPED. × 51⅓. *b*, SECOND LEG. × 15⅓.

The uropoda are not longer than the terminal segment. The outer branch is narrower and shorter than the inner branch, and is rounded at its posterior end. The inner branch is obliquely truncate, with rounded post-lateral angles. Both branches are provided with spines.

The first three pairs of legs are prehensile and with propodus unarmed; the last four pairs are ambulatory and armed with a few spines.

ROCINELA ARIES Schiœdte and Meinert.

Rocinela aries SCHIŒDTE and MEINERT, Naturhistorisk Tidsskrift (3), XII, 1879–80, pp. 401–403, pl. XIII, figs. 7–8.—RICHARDSON, Proc. U. S. Nat. Mus., XXI, 1899, p. 828; Ann. Mag. Nat. Hist. (7), IV, 1899, p. 170.

Localities.—Mazatlan; Lower California; Panama Bay; Gulf of California.

Body ovate; twice as long as wide; 10 mm.: 20 mm.

Head twice as wide as long; 2 mm.: 4 mm.; triangulate, with the front produced over the basal articles of the antennæ. Eyes large, oval, composite, separated in front by a distance equal to the length of one eye. Basal article of first antenna short, almost entirely concealed by the front; second article about twice as long as the first; third article one and a half times longer than the second. The flagellum is composed of five articles. The first antennæ extend to the middle of the fifth article of the peduncle of the second antenna or to the antero-lateral angle of the first thoracic segment. The first article of the second antennæ is twice as long as the second article, which is almost inconspicuous; the third article is twice as long as the first;

the fourth is a little longer than the third; the fifth is one and a half times longer than the fourth. The flagellum is composed of twelve articles. The second antennæ extend to the posterior margin of the second thoracic segment. The frontal lamina is small and almost inconspicuous, triangular in shape at the base, which is ventrally placed. The maxilliped has a palp of two articles.

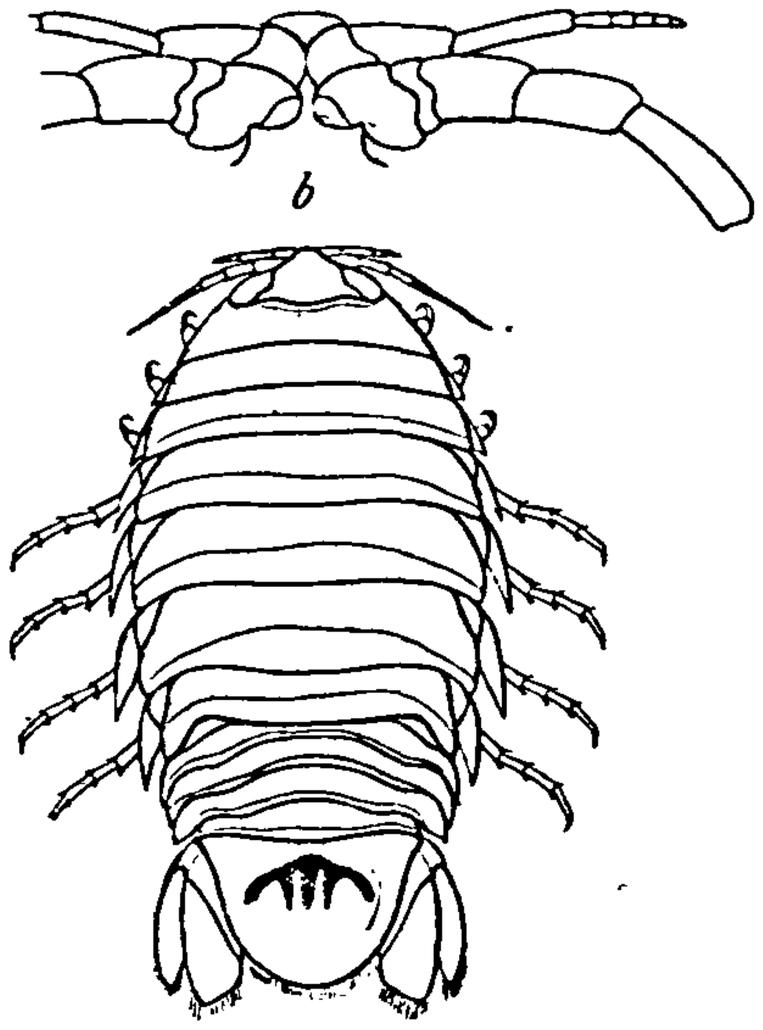


FIG. 213.—ROCINELA ARIES (AFTER SCHIŒDTE AND MEINERT). *a*, FRONTAL MARGIN, ANTENNÆ AND FRONTAL LAMINA. *b*, ADULT FEMALE. (ENLARGED.)

The first, fourth, fifth, and sixth segments of the thorax are a little longer than the others. The epimera are distinct on all the segments but the first. They are narrow plates with the posterior angles increasingly acute. The epimera of the last segment are produced beyond the posterior margin of the segment.

The first segment of the abdomen is almost entirely concealed by the last thoracic segment. The lateral parts are not separated from the dorsal portion. The sixth or terminal segment is rounded posteriorly. The base of the terminal segment is marked with three longitudinal black lines, one on either side of a median line, and two oblique lines, one on either side, and all five connected at the base. The outer branch of the uropoda is shorter than the inner branch and half as wide. The inner branch is obliquely truncate, with rounded angles. The outer branch is posteriorly rounded. The peduncle of the uropoda is as long as the outer branch. The margins of the uropoda and the terminal segment are furnished with spines.

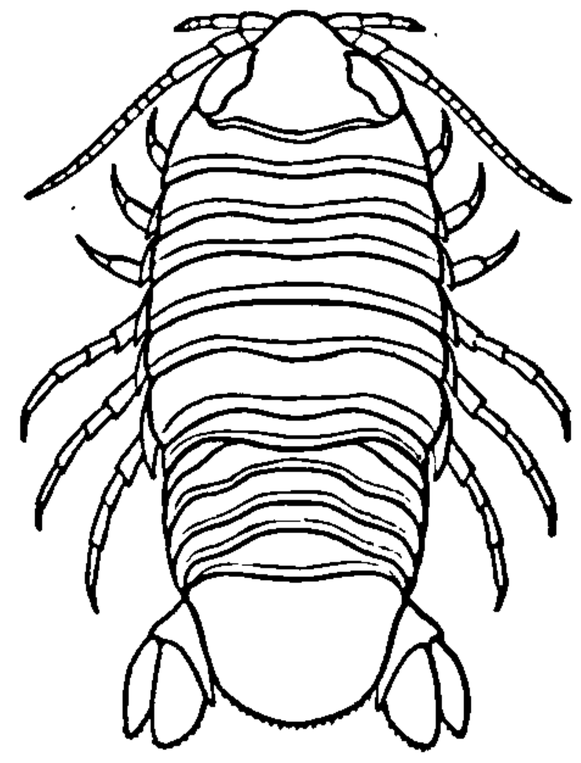


FIG. 214.—ROCINELA ARIES (AFTER SCHIŒDTE AND MEINERT). YOUNG. (ENLARGED.)

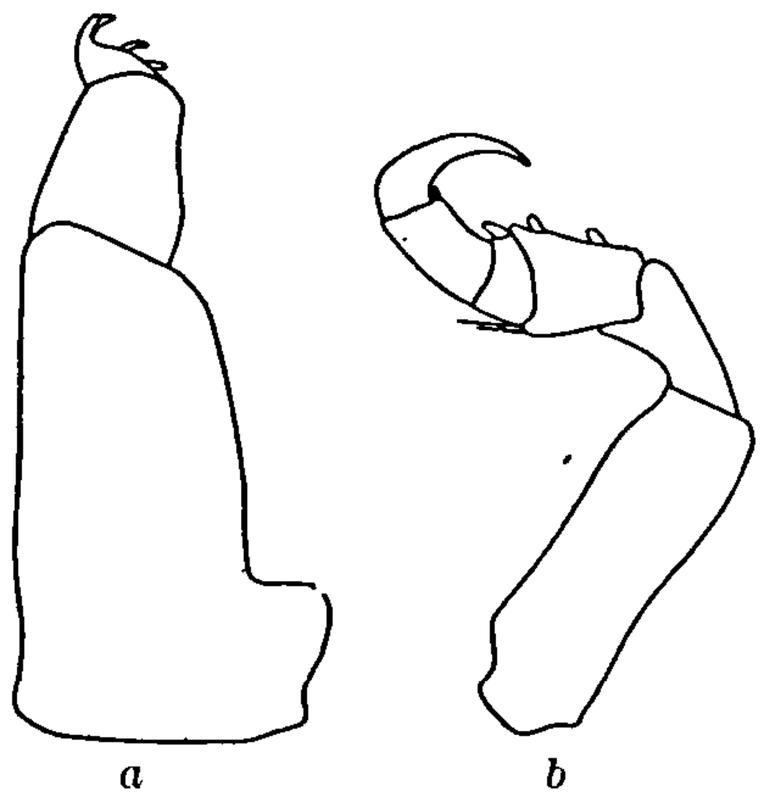


FIG. 215.—ROCINELA ARIES. *a*, MAXILLIPED. × 38¾. *b*, LEG OF SECOND PAIR. × 11½.

The first three pairs of legs are prehensile, the last four pairs ambulatory. The merus of all three anterior legs is furnished with two spines, the carpus with one spine, and the propodus of the second and third with one spine. The ambulatory legs are beset with a few spines.[a]

[a] For description of the young of the first stage, see Schiœdte and Meinert, Nat. Tidsskr. (3), XII, 1879–80, pp. 402–403.

32. Genus SYSCENUS Harger.

Body depressed. Abdomen abruptly narrower than thorax.
Eyes wanting.
First two articles of the first pair of antennæ not expanded or dilated.
Mandibles without molar expansion. Maxillipeds with the palp composed of two articles.

First three pairs of legs with the propodus not expanded, cylindrical; dactylus abruptly curved in the middle, and terminating in a very sharp point. Four posterior pairs with the propodal joint elongated.

SYSCENUS INFELIX Harger.

Syscenus infelix HARGER, Report U. S. Commissioner of Fish and Fisheries, Pt. 6, 1880, pp. 387–390; Bull. Mus. Comp. Zool. Harvard College, XI, 1883, No. 4, pp. 100–102, pl. III, figs. 5–5a; pl. IV, figs. 3–3h.

Harponyx[a] *pranzoides* SARS, Forhandlungen i Videnskab Selsk. Christiania, No. 18, 1883 (young).

Rocinela lilljeborgii BOVALLIUS, Bihang. till Vetensk. Akad. Handl., X, No. 10, 1885, pp. 3–10, pls. I–II.

Syscenus lilljeborgii BOVALLIUS, Bihang. till K. Sv. Vet. Akad. Handl., XI, No. 17, 1886–87, pp. 17–18.

Syscenus infelix RICHARDSON, Proc. Amer. Philos. Soc., XXXVII, 1898, p. 8 (footnote); American Naturalist, XXXIV, 1900, p. 219; Proc. U. S. Nat. Mus., XXIII, 1901, p. 524.—NORMAN, Ann. Mag. Nat. Hist. (7), XIV, 1904, p. 437.

Localities.—Latitude 41° 34′ 30″ north, longitude 65° 54′ 30″ west; latitude 40° 11′ 40″ north, longitude 68° 22′ west; Marthas Vineyard; south of Long Island; off Nantucket Shoals; all along the Atlantic coast as far south as Delaware Bay; west coast of Norway at Hoitingsö and Bekkervig (Sars); coast of Bohuslän (Bovallius); British Isles (Norman).

Depth.—80–640 fathoms; 516 fathoms (Norman).

Body elongate, nearly three times as long as broad, 10 mm.: 28 mm.

Head three times as wide as long, 2 mm.: 6 mm., triangular in shape, with frontal margin somewhat three-lobed, the median lobe being anterior to the other two and acutely produced between the basal articles of the antennæ, but not meeting the frontal lamina on the other side. The eyes are absent. The first pair of antennæ have the three articles of the peduncle of equal length and all conspicuous. The

[a] In the Proc. U. S. Nat. Mus., XXVII, 1904, pp. 6 and 9, I refer to the genus *Harponyx* as a separate genus. Doctor Hansen, in a letter, called my attention to this error, saying that Sars had suppressed the genus, a fact which I had temporarily overlooked.

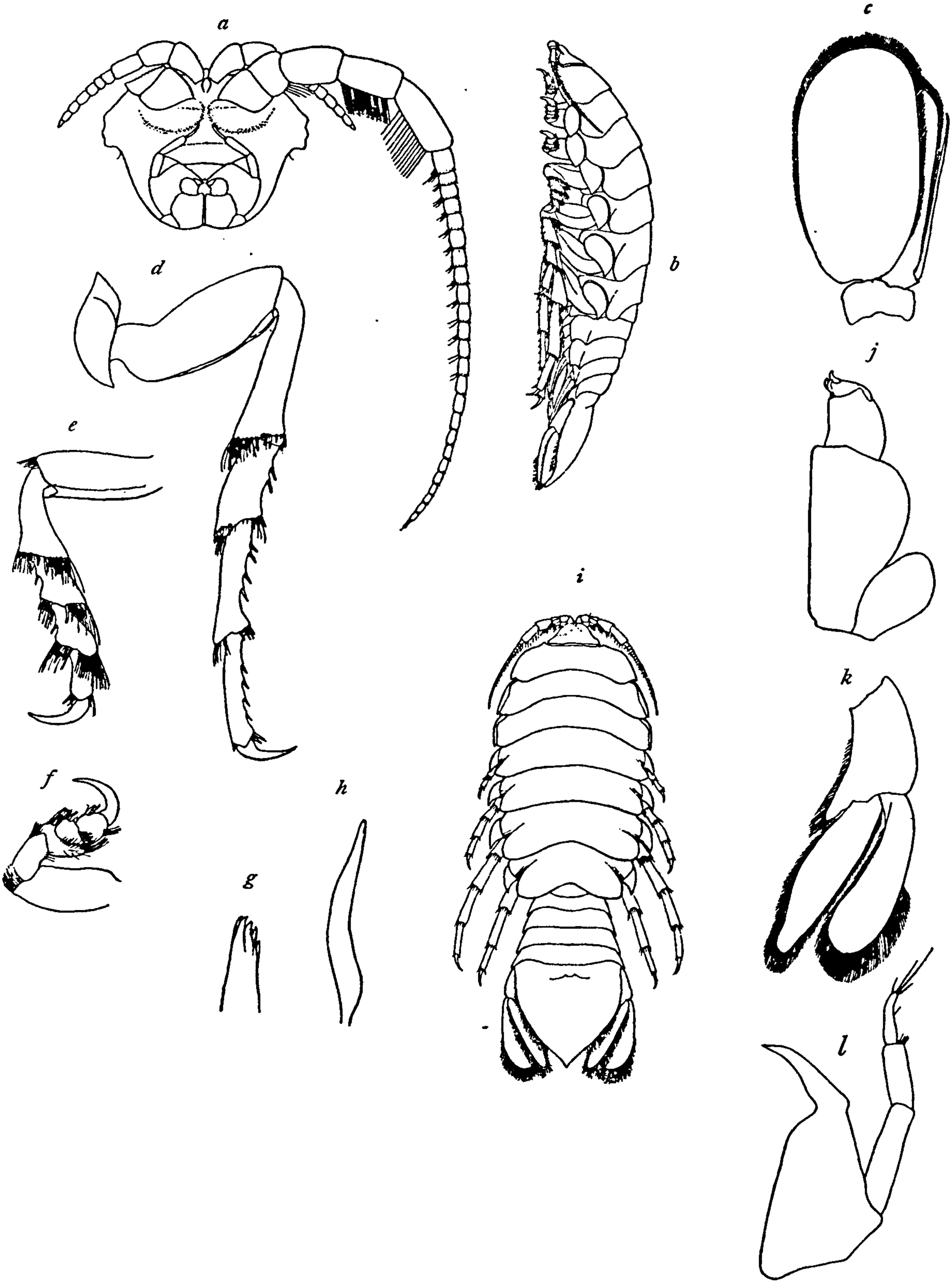


FIG. 216.—SYSCENUS INFELIX (AFTER HARGER). *a*, INFERIOR VIEW OF HEAD. × 8. *b*, LATERAL VIEW OF MALE. × 1½. *c*, SECOND PLEOPOD OF MALE. × 4. *d*, LEG OF SIXTH PAIR. × 4. *e*, LEG OF FOURTH PAIR. × 4. *f*, LEG OF FIRST PAIR. × 4. *g*, TIP OF FIRST MAXILLA. × 75. *h*, FIRST MAXILLA. × 20. *i*, DORSAL VIEW OF MALE. × 1½. *j*, LEFT MAXILLIPED. × 20. *k*, UROPOD OF MALE. × 4. *l*, LEFT MANDIBLE. × 20.

flagellum is composed of seven articles. The first antennæ extend to the end of the peduncle of the second pair of antennæ or to the posterior margin of the head. The second pair of antennæ have the first two articles equal in length; the third and fourth are also subequal, and each is about twice as long as the second; the fifth is one and a half times longer than the fourth. The flagellum is composed of twenty-five articles. The second antennæ extend to the posterior margin of the third thoracic segment. The frontal lamina is large, conspicuous, rhomboid shaped, and ventrally placed. The maxilliped has a palp of two articles.

The first segment of the thorax is longer than any of the others. The epimera are distinct from the segments with the exception of the first. They are broad plates with the posterior extremities very acute. The post-lateral angles of the first thoracic segment are also acute.

The abdomen is abruptly very much narrower than the thorax. All six segments are distinct. The lateral parts are not separated off from the dorsal portion. The terminal segment is large and triangular in shape, with the posterior extremity acutely produced. The uropoda are as long as the terminal segment of the abdomen. The outer branch is wider but shorter than the inner branch; it is more broadly rounded posteriorly than the inner branch. The peduncle of the uropoda is not produced at the inner angle.

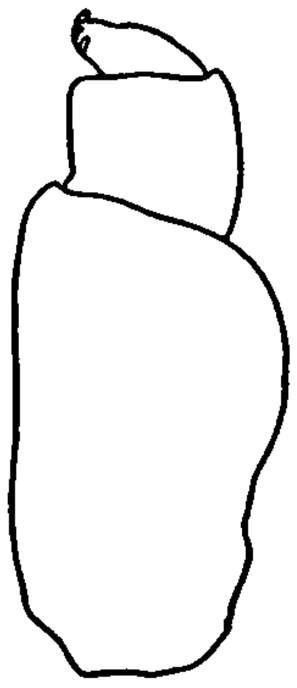


FIG. 217.—SYSCENUS INFELIX. MAXILLIPED. × 27½.

The first three pairs of legs are prehensile, the last four pairs ambulatory. The first three pairs are not furnished with spines. The fifth pair of legs is a little longer than the fourth pair. The sixth and seventh pairs are equal in length and extremely long, being very much longer than the fourth and fifth pairs.

Family IX. CYMOTHOIDÆ.

Antennæ strongly reduced and without clear distinction between peduncle and flagellum. All seven pairs of legs prehensile, terminating in strong hooked fingers. Pleopods not ciliated. Terminal segment and uropoda usually not ciliated.

Maxillipeds with palp composed of two articles; terminal article furnished with hooks.

Mandibles with palps.

First maxillæ with masticatory lobe composed of a single tapering article furnished with four spines at tip.

Second maxillæ bilobed at tip and furnished with numerous spines.

Epimera distinct on all the segments with the exception of the first.

Parasitic forms.

ANALYTICAL KEY TO THE GENERA OF THE FAMILY CYMOTHOIDÆ.

a. Head posteriorly produced in three lobes, a larger median lobe and two small lateral lobes; not at all immersed in first thoracic segment. Anterior margin of first thoracic segment distinctly trisinuate.

b. Uropoda and terminal segment ciliated. Eyes large, conspicuous.
Genus *Ægathoa* Dana

b'. Uropoda and terminal segment not ciliated. Eyes small.

c. Posterior angles of first segment of body prominent or produced, very often acute; posterior angles of the following segments increasing gradually in length, the first of these very often scarcely produced, the posterior ones very often produced, abruptly longer than the first. Epimera of the first segments extending beyond the posterior angles of the segment; posterior ones produced, acute.....Genus *Nerocila* Leach

c'. Posterior angles of first six segments of body scarcely or not at all prominent, those of seventh segment produced. Epimera of first segments very often almost reaching, or not reaching by a short distance, the posterior angle of the segment.

d. Body compact. Head not constricted at the base. Uropoda very often more or less longer than terminal segment. Legs gradually increasing in length.....Genus *Anilocra* Leach

d'. Body relaxed. Head constricted at the base. Uropoda much shorter than terminal segment. Legs gradually much longer successively; seventh pair abruptly very much longer.....Genus *Olencira* Leach

a'. Head not produced posteriorly in three lobes; more or less immersed in first thoracic segment. Anterior margin of first thoracic segment not trisinuate.

b. Antennæ very much dilated; those of the first pair contiguous at base.

c. Epimera of the first pair with a carina produced in the form of a spoon in female. Ungulæ very long, unequal in length; those of the third pair longest, abruptly longer than second pair. Terminal segment transverse.....Genus *Ceratothoa* Dana

c'. Epimera of the first pair not produced in female. Ungulæ mostly very short, very rarely long, equal in length. Terminal segment subtriangular, semicircular, often bilobed.....Genus *Meinertia* Stebbing

b'. Antennæ not dilated, but compressed.

c. Antennæ of the first pair almost contiguous at base.

d. Body hunched or compressed; the posterior segments of the body on one side flattened, dilated.....Genus *Agarna* Schiœdte and Meinert

d'. Body evenly convex, not hunched; posterior segments of the body rather convex.....Genus *Indusa* Schiœdte and Meinert

c'. First pair of antennæ widely separated at the base.

d. Abdomen manifestly separated from the thorax, abruptly narrower than thorax.....Genus *Cymothoa* Fabricius

d'. Abdomen continuous with thorax, not narrower than thorax.

e. Abdomen very little or scarcely immersed. Segments of thorax either equal in length or the first segment abruptly longer and the last segment abruptly shorter than the others.....Genus *Livoneca* Leach

e'. Abdomen very deeply and profoundly immersed. First segment of the thorax manifestly longer than the second; six posterior segments gradually decreasing a little in length...Genus *Irona* Schiœdte and Meinert

33. Genus ÆGATHOA[a] Dana.

Eyes large, oval, composite. Posterior margin of head produced in three lobes.

Anterior margin of first thoracic segment manifestly trisinuate. Post-lateral angles of thoracic segments not produced. Epimera distinct on all the segments of the thorax with the exception of the first; they extend the full length of the segments and are not acutely produced posteriorly.

The abdomen is not narrower than the thorax, but continues the oval outline of the body. The abdominal segments are not shorter than the last thoracic segments. Pleopods not ciliated. Uropoda and terminal segment of abdomen furnished with hairs.

ANALYTICAL KEY TO THE SPECIES OF THE GENUS ÆGATHOA.

a. Frontal margin of head produced anteriorly in a median lingulate projection.
Ægathoa linguifrons Richardson

a′. Frontal margin of head not produced anteriorly in a median lingulate projection.

b. Surface of head smooth, evenly convex. Second pair of antennæ composed of ten articles. First thoracic segment longer than any of the succeeding segments, which are of equal length ..... *Ægathoa oculata* (Say)

b′. Surface of head with central portion sharply raised above the lateral portion, which is deeply excavate just in front of the eyes. Second pair of antennæ composed of eight articles. First three thoracic segments of equal length; last four subequal and somewhat shorter than first three.
Ægathoa medialis Richardson

ÆGATHOA LINGUIFRONS Richardson.

Ægathoa linguifrons RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 526.

Locality.—Trinidad.

Body narrow, elongate; abdomen not narrower than thorax.

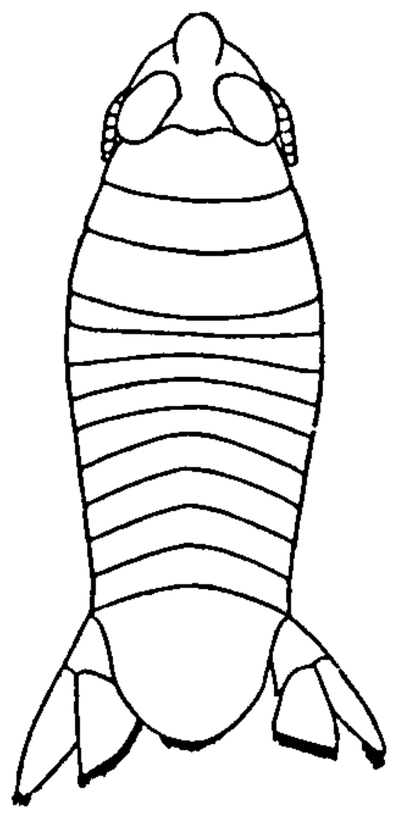


FIG. 218.—ÆGATHOA LINGUIFRONS.

Head with sides rounded. Frontal margin abruptly produced anteriorly into a median lingulate projection, with apex rounded; posterior part of projection forming a raised surface sharply defined on anterior part of head, extending back to eyes. Eyes large, oval, occupying two-thirds the width of head. First pair of antennæ nine-jointed. Second pair more slender equal in length to first pair and ten-jointed.

First three thoracic segments long, second one shortest; last four segments short, of nearly equal length. All the abdominal segments distinct; first five equal in length, terminal segment rounded at apex. Uropoda longer than terminal segment. Inner branch obliquely

[a] This genus, perhaps, represents the young of *Livoneca*. The figure given by Schiœdte and Meinert of the young female of *Livoneca redmanni* does not apparently differ from *Ægathoa oculata* (Say). I have not suppressed the genus, however, because I could not be positive of the identity of these forms.

truncate at apex and shorter than outer branch, which is obtusely pointed.

Both branches, as well as the posterior margin of the terminal segment, are fringed with hairs.

Legs similar in structure, with curved dactyli.

Color, light brown, with scattered black dots.

A single specimen was obtained at Trinidad.

Type.—Cat. No. 23903, U.S.N.M.

ÆGATHOA OCULATA[a] (Say).

Cymothoa oculata SAY, Jour. Acad. Nat. Sci. Phila., I, 1818, pp. 398–399.

Ægathoa loliginea HARGER, Am. Jour. Sci. (3), XV, 1878, p. 376; Proc. U. S. Nat. Mus., II, 1879, p. 161; Report U. S. Commissioner of Fish and Fisheries, Pt. 6, 1880, pp. 393–394, pl. x, fig. 66.—RICHARDSON, American Naturalist, XXXIV, 1900, p. 220; Proc. U. S. Nat. Mus., XXIII, 1901, pp. 526–527.

Localities.—Savin Rock, near New Haven, Connecticut; Fort Macon, North Carolina; St. Johns River, Florida (Say); Crisfield, Maryland; Cozumel; St. Thomas, West Indies.

Parasite of squid (*Loligo pealii*); young mullet.

Say's type of this species, placed in the Academy of Natural Sciences of Philadelphia, is undoubtedly identical with Harger's *Ægathoa loliginea*. The earlier name must, therefore, be accepted for this species.

As the type specimen is dry and not perfectly preserved, the following description is from an alcoholic specimen:

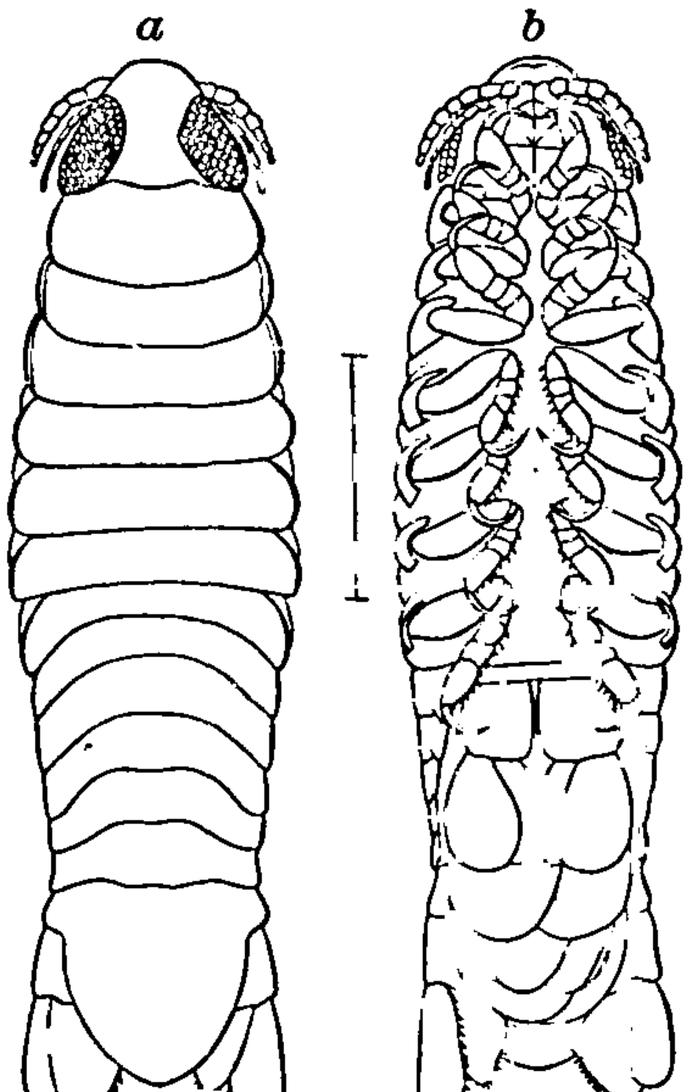


FIG. 219.—ÆGATHOA OCULATA (AFTER HARGER). *a*, DORSAL VIEW. × 4. *b*, VENTRAL VIEW. × 4.

Body elongate, nearly four times longer than wide, 3 mm.: 11 mm.

Head as wide as long, 2 mm.: 2 mm., slightly narrower anteriorly than posteriorly, with the anterior margin widely rounded. The posterior margin of the head is produced in three equal lobes. The eyes are large, oval, composite, and situated in the post-lateral angles of the head, but extend along the sides of the head almost to the antero-lateral angles. The first pair of antennæ are composed of eight articles, and extend to the posterior margin of the head. The second pair of antennæ are composed of nine articles, and extend to the middle of the first thoracic segment. The basal articles of the first pair of antennæ are not adjacent, but are sep-

[a] See Harger for more detailed description, Report U. S. Commission of Fish and Fisheries, Pt. 6, 1880, pp. 393–394.

arated by a small space. The maxillipeds have a palp composed of two articles. The palp of the mandibles has three articles.

The first segment of the thorax is the longest, and is 1½ mm. in length. The second and third segments are each 1 mm. long. The four following segments are each ½ mm. long. The epimera are distinctly separated on all the segments with the exception of the first. They extend the full length of the lateral margins.

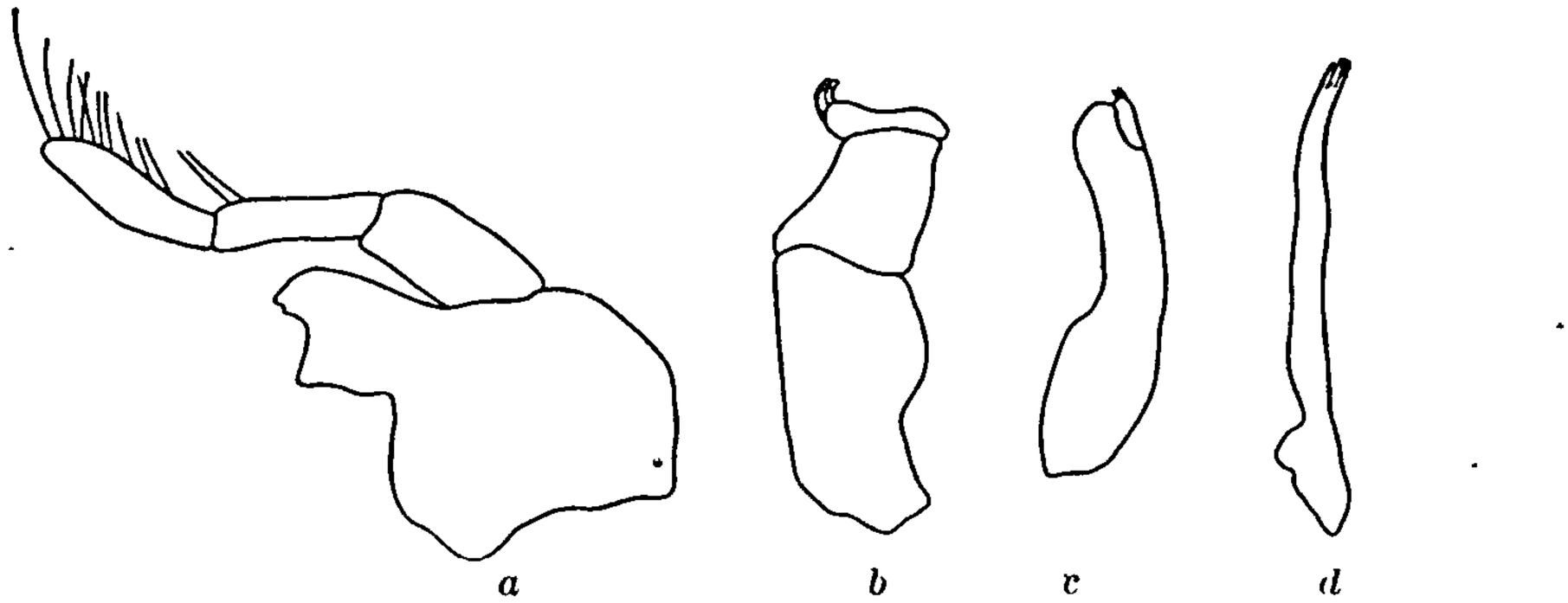


FIG. 220.—ÆGATHOA OCULATA. *a*, MANDIBLE. × 51⅔. *b*, MAXILLIPED. × 51⅔. *c*, SECOND MAXILLA. *d*, FIRST MAXILLA. × 51⅔.

The abdomen is as wide as the thorax, and the abdominal segments are as long as the thoracic segments. The length of the abdomen is 5 mm., or nearly half the entire length of the body. The sixth or terminal segment is long and rounded posteriorly. The uropoda are longer than the terminal segment. The outer branch is longer and narrower than the inner branch and is posteriorly rounded. The inner branch is broad posteriorly and is obliquely truncate. The uropoda and the terminal abdominal segment are fringed with hairs.

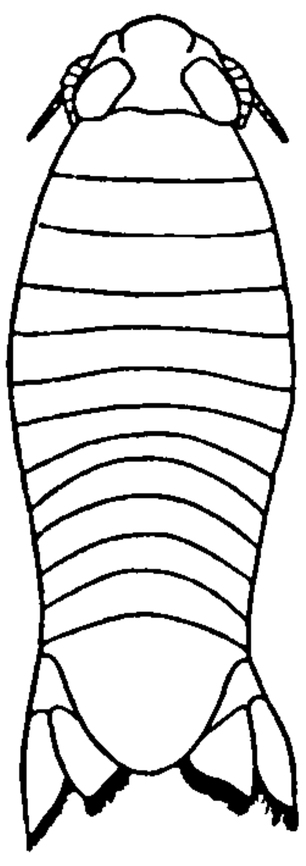


FIG. 221.—ÆGATHOA MEDIALIS.

All the legs are prehensile and terminate in long, narrow, curved dactyli. The propodus is furnished with five spines, the carpus with two in all the legs.

ÆGATHOA MEDIALIS Richardson.

Ægathoa medialis RICHARDSON, American Naturalist, XXXIV, 1900, p. 220; Proc. U. S. Nat. Mus., XXIII, 1901, p. 527.

Locality.—Barren Island, Chesapeake Bay.

Depth.—3 to 25 fathoms.

Body narrow, elongate; abdomen not narrower than thorax.

Head with anterior margin broadly rounded in front; central portion sharply raised above lateral portion, which is deeply excavate just in front of eyes. Eyes large, occupying two-thirds the width of the head. First pair of antennæ eight-jointed; second pair more slender, equal in length, and nine-jointed.

First three segments of thorax subequal, last four subequal and some-

what shorter than first three. First five abdominal segments equal in length. Terminal segment rounded posteriorly. Uropoda longer than terminal segment; branches unequal. Outer branch the longer; inner branch obliquely truncate. Legs similar in structure, with curved dactyli. Color, light brown, densely covered with black spots. Single specimen from Barren Island, Chesapeake Bay.

Depth.—3 to 25 fathoms.

Type.—Cat. No. 23904, U.S.N.M.

34. Genus NEROCILA Leach.[a]

Body relaxed, very often flattened. Head posteriorly produced in three lobes, not at all immersed. First pair of antennæ almost contiguous at the base.

First segment of thorax with the anterior margin deeply trisinuate. Posterior angles of the segments from the second to the last increasing gradually in length, the first of these often but little produced, the posterior ones almost always produced and often abruptly longer than the first ones. The anterior epimera almost always extend to or beyond the posterior angle of the segment; the posterior epimera are produced and acute, but do not reach the posterior angle of the segment.

Abdomen free, rarely covered at the base or the sides. Legs rather long.

ANALYTICAL KEY TO THE SPECIES OF THE GENUS NEROCILA.

a. Terminal abdominal segment quadrate, with post-lateral angles rounded and posterior margin acuminate and produced in an acute point.

b. Body a little more than one and a half times longer than wide. Head as long as wide. Post-lateral angles of all the segments of the thorax are produced backward in long acute processes, increasing in length from the first to the seventh segment. The epimera of the second segment extend beyond the post-lateral angles of the segment; those of the third segment extend to the post-lateral angles of the segment; all the others reach the posterior margins of the segments.....*Nerocila acuminata* Schiœdte and Meinert

b′. Body nearly two and a half times longer than wide. Head wider than long. The post-lateral angles of only the last two segments of the thorax are produced. The epimera do not extend beyond the posterior margins of the segments, except in the last segment where they almost reach the extremity of the post-lateral angles.....*Nerocila californica* Schiœdte and Meinert

a′. Terminal segment of abdomen not quadrate; posterior margin not acuminate.

b. Last segment of abdomen regularly rounded. Uropoda longer than abdomen. Eyes black, distinct. Head as wide as long, truncate in front. Terminal abdominal segment without median longitudinal carina.

Nerocila munda Harger

b′. Last segment of abdomen lanceolate. Uropoda shorter than abdomen. Eyes entirely wanting. Head wider than long and truncately rounded anteriorly. Terminal abdominal segment with median longitudinal carina.

Nerocila lanceolata (Say)

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[a] See Schiœdte and Meinert for the characters of the genus, Nat. Tidsskr. (3), XIII, 1881–83, pp. 4–5.

NEROCILA ACUMINATA Schiœdte and Meinert.

Nerocila acuminata SCHIŒDTE and MEINERT, Naturhistorisk Tidsskrift (3), XIII, 1881–1883, pp. 48–50, pl. III, figs. 5–6.—RICHARDSON, American Naturalist, XXXIV, 1900, p. 220; Proc. U. S. Nat. Mus., XXIII, 1901, p. 527; Trans. Conn. Acad. Sci., XI, 1902, p. 291.

Localities.—Atlantic Ocean and Gulf of Mexico; St. Anna, Mexico; Louisiana; Pensacola and St. Marys River, Florida; Fort Macon, North Carolina; Newpoint, Virginia; Biloxi, Mississippi; Bermudas; Lake Harley, Florida; south Florida.

Parasites of the saw-fish; *Chætodipterus faber* (side of body); *Spheroides maculatus; Alutera schœpfii; Lachnolaimus maximus* (on fin).

Body ovate, a little more than one and a half times longer than wide, 13 mm.: 21 mm.

Head, somewhat quadrate, as long as wide, 4 mm.: 4 mm., with the anterior margin almost straight, slightly rounded, and the posterior margin produced in three lobes, the middle one being much the larger. Eyes absent. The first pair of antennæ are composed of eight articles and extend to the post-lateral lobe of the head. The second pair of antennæ are composed of nine articles and extend just a little beyond the first pair of antennæ. The maxillipeds have a palp of two articles. The palp of the mandibles is composed of three articles.

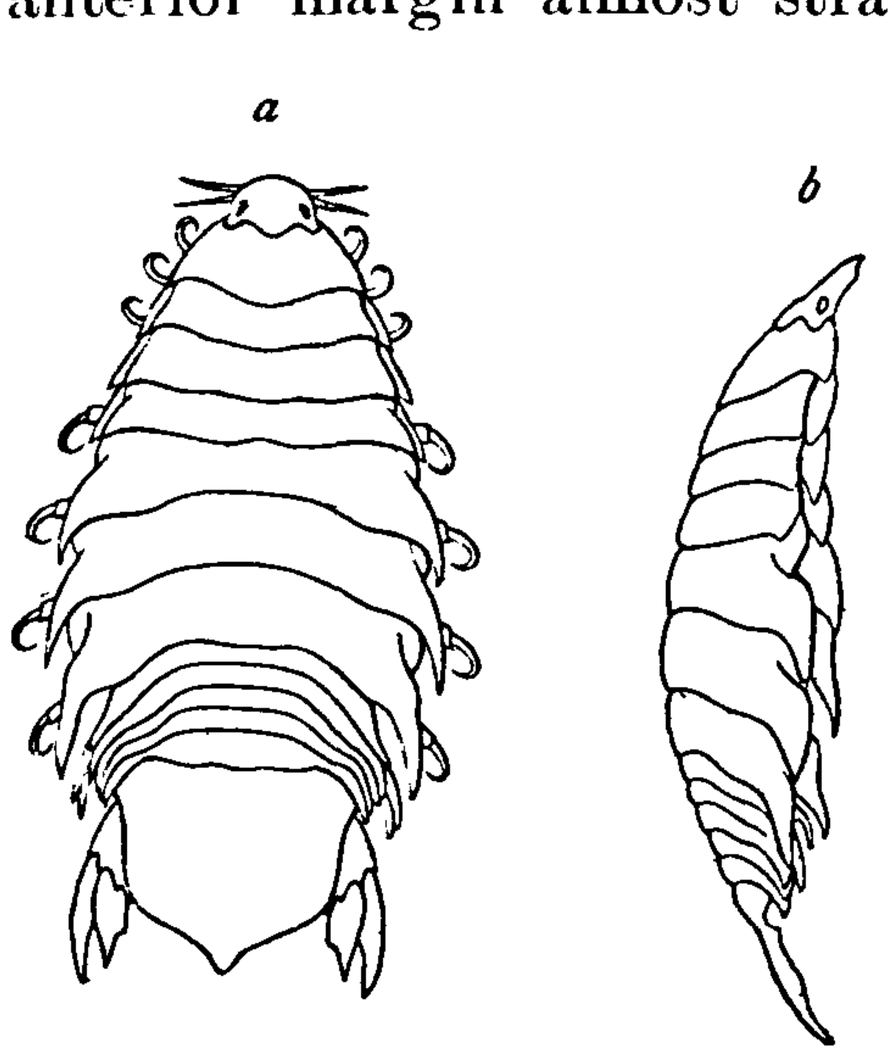

FIG. 222.—NEROCILA ACUMINATA (AFTER SCHIŒDTE AND MEINERT). *a*, ADULT FEMALE. *b*, LATERAL VIEW. (ENLARGED.)

The first segment of the thorax is longer than any of the three following segments; the fifth, sixth, and seventh segments are longer than any of the three preceding segments, but gradually decrease in length, the fifth being the longest. The body is broadest at the fifth and sixth segments. The post-lateral angles of all the segments are produced backward in long acute processes, increasing in length from the first to the seventh segment. The epimera are distinctly separated from the segments, with the exception of the first. They are long, narrow plates, becoming more acutely pointed at their posterior extremities from the first to the seventh. The epimera of the second segment extend beyond the post-lateral angles of the segment; those of the third segment extend to the post-lateral angles of the segment; all the others reach the posterior margins of the segments, but do not extend to the extremity of the post-lateral angles.

The segments of the abdomen are all distinct. The sixth or terminal segment is a little broader than long, 6 mm.: 5 mm., almost quadrate, with the post-lateral angles rounded and a small triangular point in the middle of the posterior margin. The uropoda are longer than the terminal abdominal segment. Both branches are produced to long, narrow, acute extremities, the outer branch being slightly narrower at

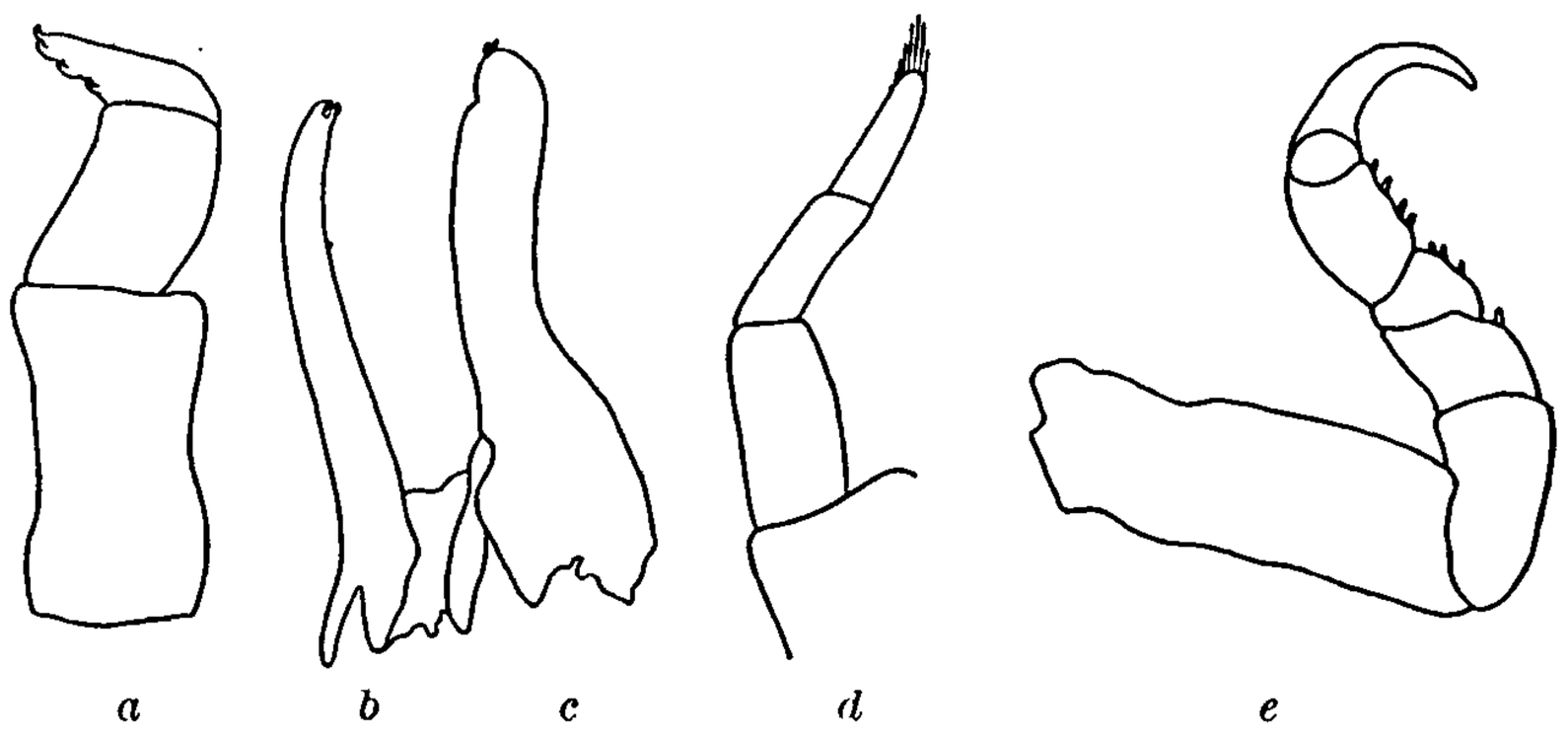

FIG. 223.—NEROCILA ACUMINATA. *a*, MAXILLIPED. × 27⅓. *b*, FIRST MAXILLA. × 27⅓. *c*, SECOND MAXILLA. × 27⅓. *d*, PALP OF MANDIBLE. × 27⅓. *e*, SEVENTH LEG. × 9⅔.

the base and somewhat longer than the inner branch. The inner branch is 3 mm. long; the outer branch 4 mm. in length.

The legs are all prehensile, slightly increasing in length, with long, curved dactyli.

There are two longitudinal bands or stripes of a light-brown or yellow color extending the entire length of the body, one on either side of the median line. The other parts of the body are dark greenish brown.

NEROCILA CALIFORNICA Schiœdte and Meinert.

Nerocila californica SCHIŒDTE and MEINERT, Naturhistorisk Tidsskrift (3), XIII, 1881–83, pp. 72–76, pl. v, figs. 12–13; pl. vi, figs. 1–2.—RICHARDSON, Proc. U. S. Nat. Mus., XXI, 1899, p. 830; Ann. Mag. Nat. Hist. (7), IV, 1899, p. 172; American Naturalist, XXXIV, 1900, p. 220.

Localities.—San Diego, California; Taboga Island, Panama Bay; off Point Sur, California; National City, California.

Parasites of *Promicrops guttatus;* cat-fish on fin; *Gyropleurodus francisci* on dorsal fin; on dorsal and caudal fin of *Paralabrax clathrata*, *Scorpæna guttata*, *Triakis semifasciata*, *Myliobatis* sp.

Body oblong-ovate, nearly two and a half times longer than wide, 8 mm.: 19 mm.

Head, wider than long, 2½ mm.: 3½ mm., with the anterior margin widely rounded, the posterior margin produced in three lobes, the middle one of which is much the larger. The eyes are indistinct and have almost entirely disappeared. They have degenerated, probably owing to the parasitic mode of life, and are certainly functionless. The first pair of antennæ are composed of eight articles and extend to the end of the seventh article of the second pair of antennæ. The second

pair of antennæ are composed of ten articles, and extend to the middle of the first thoracic segment. The maxillipeds have a palp of two articles. The palp of the mandibles is composed of three articles.

The first segment of the thorax is a little longer than any of the three following segments; the last three segments are longer than any

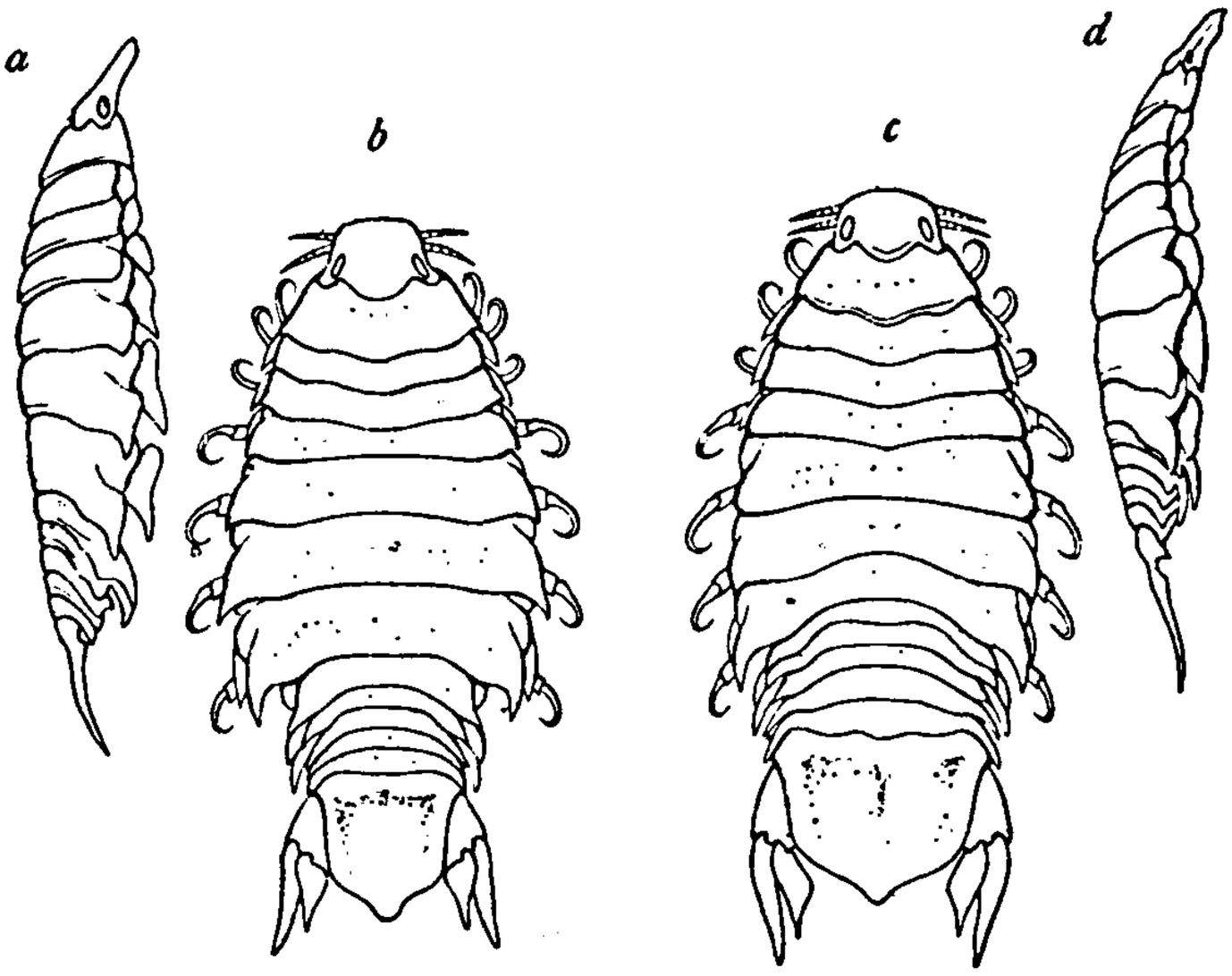

FIG. 224.—NEROCILA CALIFORNICA (AFTER SCHIŒDTE AND MEINERT). *a*, LATERAL VIEW. *b*, ADULT FEMALE. *c*, YOUNG FEMALE. *d*, LATERAL VIEW. (ENLARGED.)

of the three preceding segments and are about equal in length to the first segment. The thorax is broadest at the sixth segment. The post-lateral angles of only the last two segments are produced, those of the sixth segment being very little produced, and those of the seventh segment not much produced. The epimera of all the segments, with the exception of the first, are distinctly separated from the segments. The

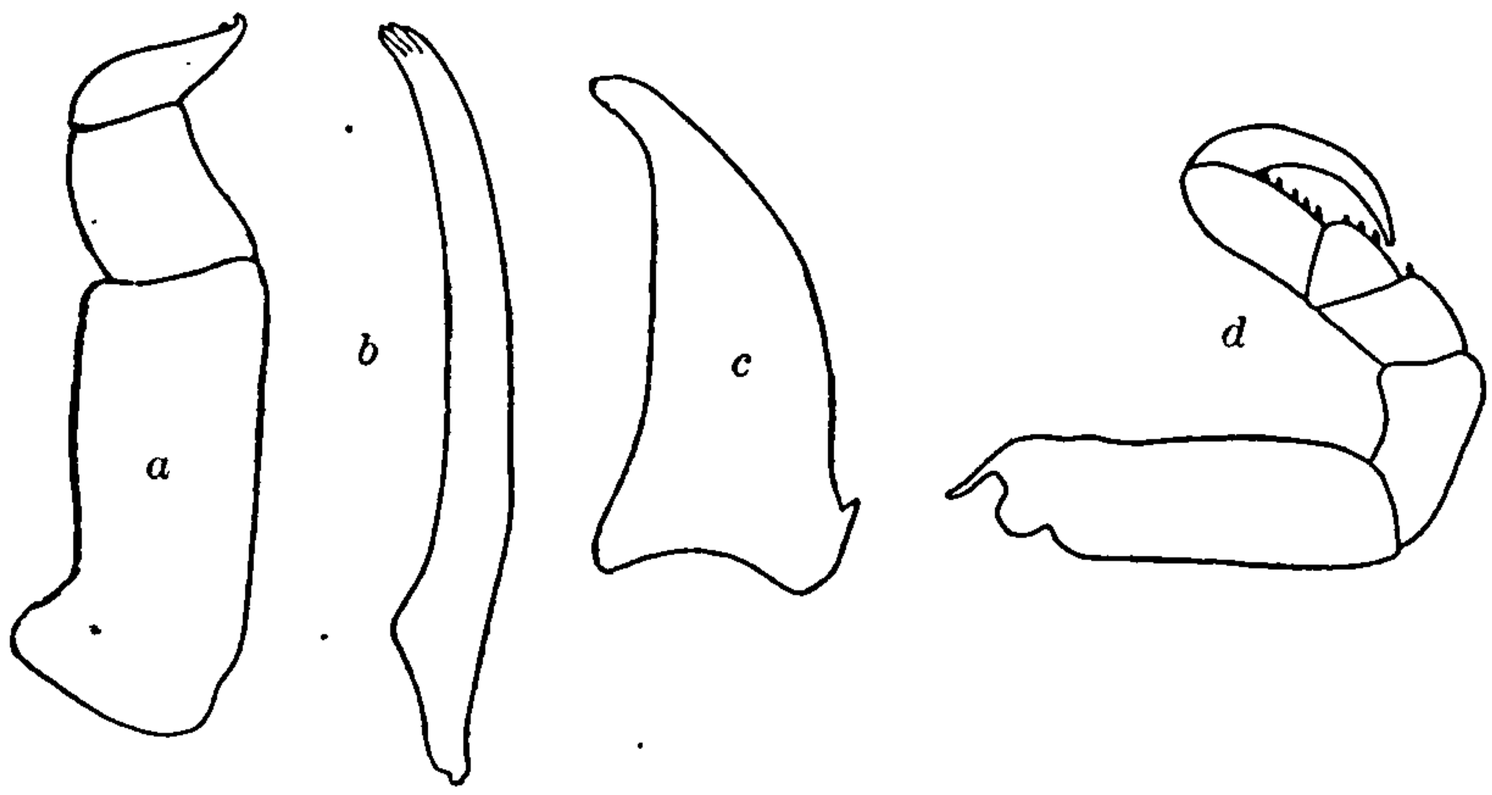

FIG. 225.—NEROCILA CALIFORNICA. *a*, MAXILLIPED. × 27⅓. *b*, FIRST MAXILLA. × 27⅓. *c*, MANDIBLE. × 51⅔. *d*, SEVENTH LEG. × 9⅓.

first three have the posterior extremities rounded; the extremities of the last three are more acutely pointed. The epimera do not extend beyond the posterior margins of the segments (and they extend to the posterior margin) except in the last segment, where they almost reach the extremity of the post-lateral angles.

All of the segments of the abdomen are distinct. The sixth or terminal segment is about as broad as long, 4 mm.: 4 mm. The segment is somewhat quadrate, with the post-lateral angles obtusely rounded, and the posterior margin produced in a small, triangular median point. The uropoda are longer than the terminal abdominal segment. The outer branch is longer than the inner branch, 3 mm.: 4 mm. Both branches are produced to narrow, acute extremities, the outer branch being also somewhat narrower at the base than the inner branch.

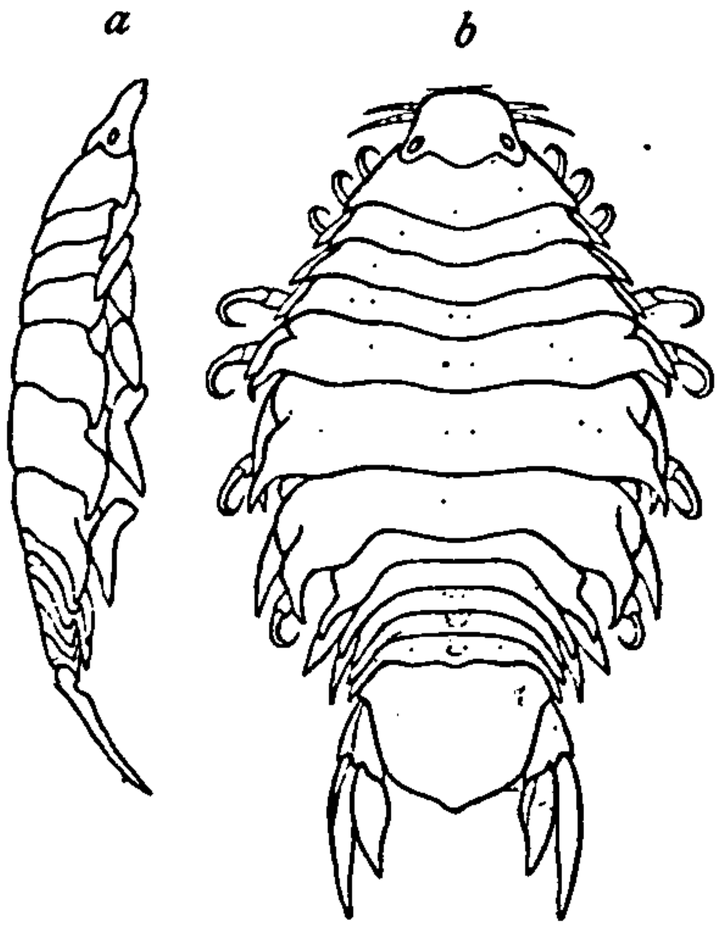

FIG. 226.—NEROCILA CALIFORNICA (AFTER SCHIŒDTE AND MEINERT). *a*, LATERAL VIEW. *b*, ADULT FEMALE. (ENLARGED.)

All the legs are prehensile, gradually increasing in length, and terminate in long, curved dactyli.

There are two longitudinal bands or stripes of a yellow or light-brown color, extending the entire length of the body, one on either side of the median line. The other parts of the body are a dark greenish brown color.

NEROCILA MUNDA Harger.

Nerocila munda HARGER, with VERRILL, Report U. S. Commissioner of Fish and Fisheries, 1873, Pt. 1, p. 571 (277); p. 459 (165), 571.—HARGER, Proc. U. S. Nat. Mus., II, 1879, p. 161; Report U. S. Commissioner of Fish and Fisheries, 1880, Pt. 6, pp. 392-393, pl. x, fig. 65.—RICHARDSON, American Naturalist, XXXIV, 1900, p. 220; Proc. U. S. Nat. Mus., XXIII, 1901, p. 528.

Locality.—Vineyard Sound, at Woods Hole.

Found on dorsal fin of *Alutera schoepfii*.

Body oblong-ovate, a little more than twice as long as wide, 6 mm.: 13 mm.

Head large, sub-quadrate, about as wide as long, 2 mm.: 2 mm., with the posterior margin tri-lobate, the median lobe being the largest. The anterior margin is somewhat triangulate, with apex obtusely rounded. The eyes are small, round, composite, and situated in the post-lateral angles of the head. The first pair of antennæ are composed of eight articles and extend to the middle of the first thoracic segment. The second pair of antennæ are composed of twelve articles and extend one or two articles beyond the first antennæ; the last four articles are very slender and gradually diminish in size and length. The maxilliped has a palp of two articles. The palp of the mandibles is composed of three articles.

The thorax is broadest at the fifth and sixth segments. The first and fifth segments are longer than any of the others. The post-lateral angles of the last three segments are acutely produced, and extend

beyond the epimera. The epimera are distinct on all the segments with the exception of the first. The first three are small and the first two have the posterior margins rounded. The last four are acutely produced, the epimera extending to the posterior margins of the segments, but not to the extremity of the postlateral angles in the last three segments.

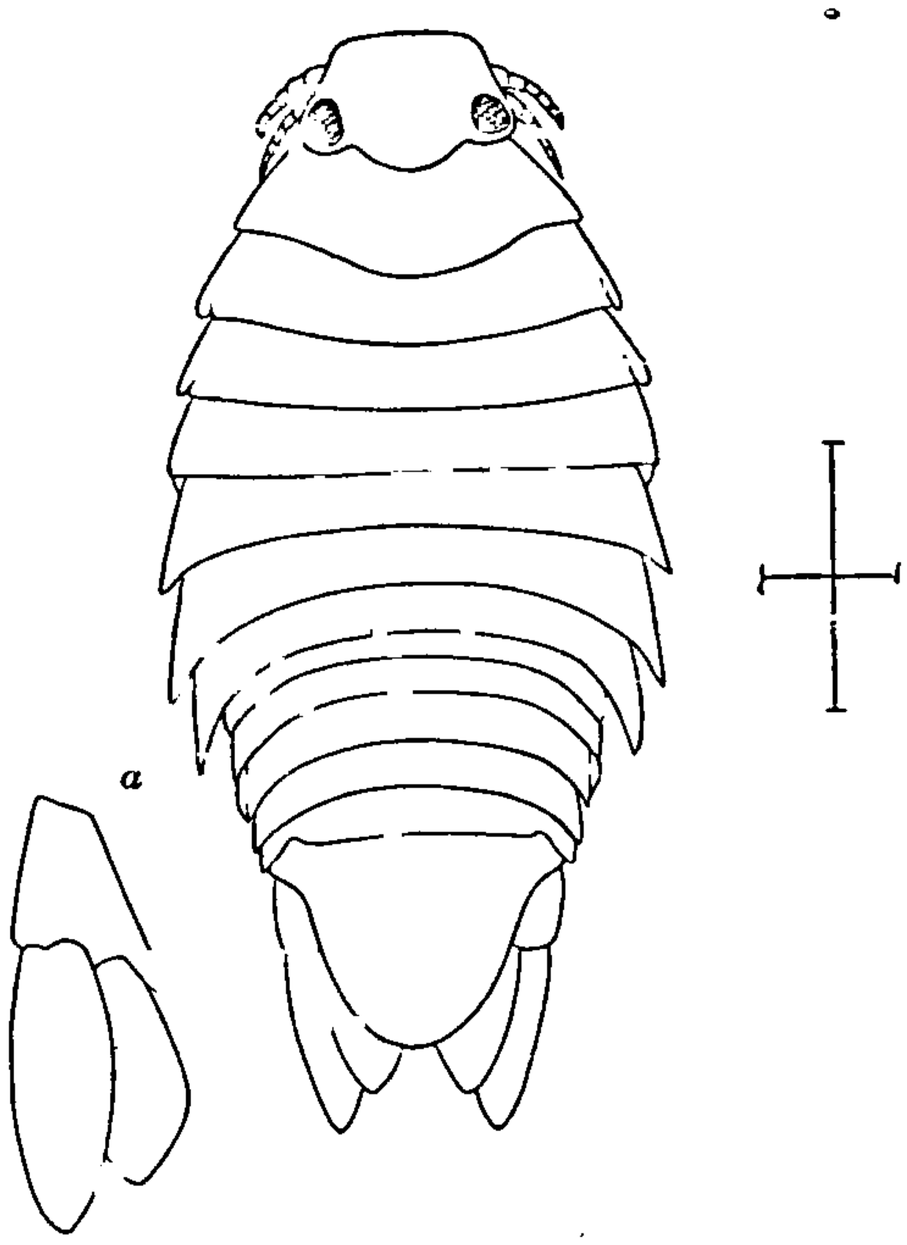

FIG. 227.—NEROCILA MUNDA (AFTER HARGER). × 4. *a*. UROPOD. × 6.

All the segments of the abdomen are distinct. The sixth or terminal segment is rounded posteriorly. The inner branch of the uropoda is broad with the extremity obliquely truncate; it extends a little beyond the tip of the terminal abdominal segment. The outer branch is one-fourth longer than the inner branch, is slightly narrower, and is produced to a narrow rounded extremity.

All the legs are prehensile, with long, curved dactyli.

There are two light longitudinal stripes or bands extending the entire length of the body, one on either side of the median line.

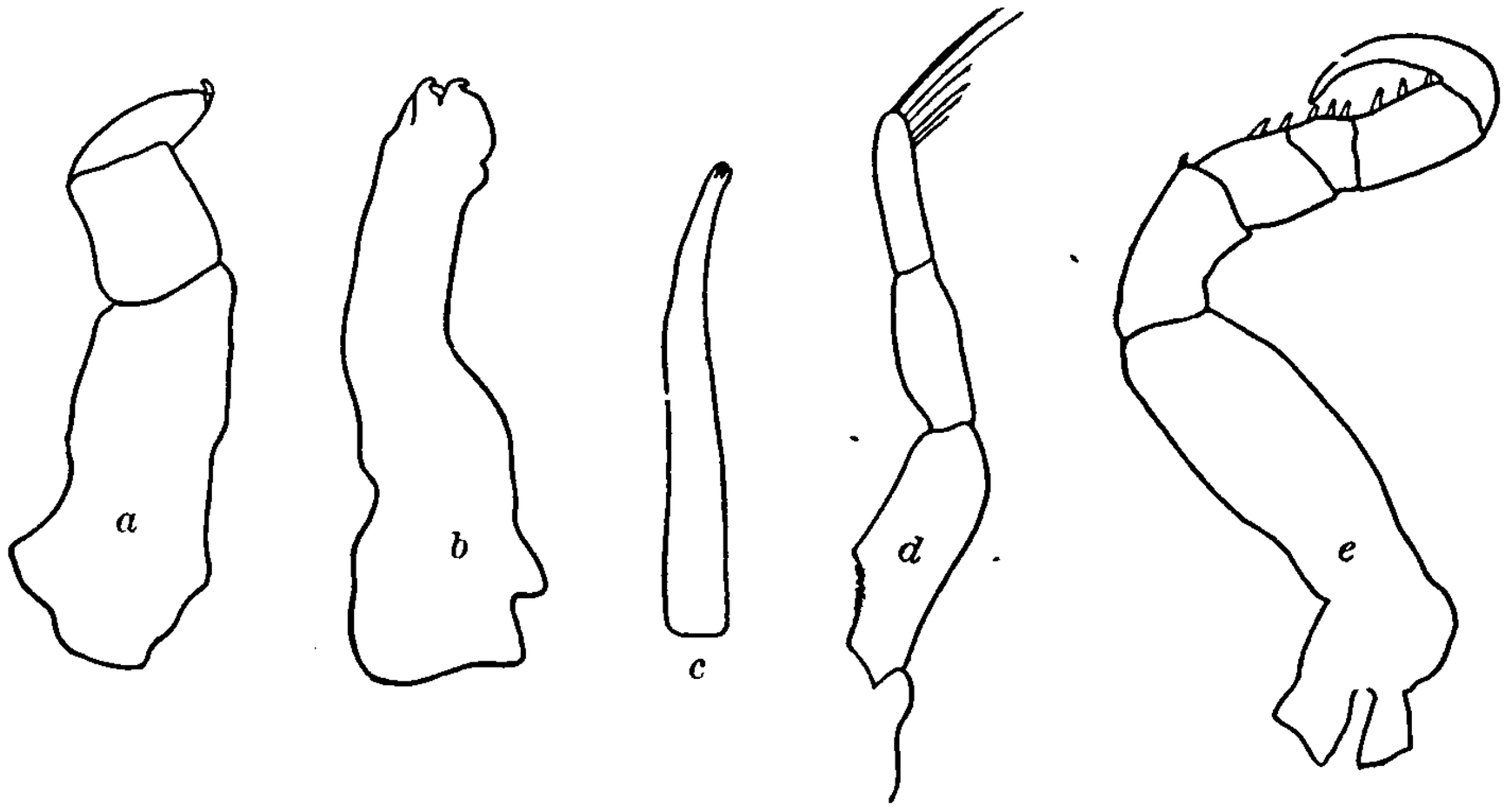

FIG. 228.—NEROCILA MUNDA. *a*, MAXILLIPED. × 51⅔. *b*, SECOND MAXILLA. × 51⅔. *c*, FIRST MAXILLA. × 51⅔. *d*, PALP OF MANDIBLE. × 51⅔. *e*, SEVENTH LEG. 15⅓.

NEROCILA LANCEOLATA (Say).

Cymothoa lanceolata SAY, Jour. Acad. Nat. Sci. Phila., I., 1818, pp. 397–398.—RICHARDSON, American Naturalist, XXXIV, 1900, p. 221; Proc. U. S. Nat. Mus., XXIII, 1901, p. 530.

Locality.—Cumberland Island, Georgia.

Having seen Say's type specimen of *Cymothoa lanceolata* which is in the Academy of Natural Sciences of Philadelphia, I find that it should be referred to the genus *Nerocila*.

Body oblong-ovate, nearly twice as long as wide, 10 mm.:19 mm.

Head a little wider than long, 3 mm.:4 mm., with the anterior margin rounded truncate and the posterior margin produced in three lobes, the middle lobe being deeper than and about twice as wide as the lateral lobes. The eyes are entirely absent; no traces of them are to be seen. The first pair of antennæ are composed of eight articles and extend to the middle of the first thoracic segment; they are separated at the base by a distance of 1 mm. The second pair of antennæ are composed of nine articles and extend only a little beyond the end of the first pair of antennæ.

The first thoracic segment is 2 mm. long, about twice as long as any of the three following segments, which are each 1 mm. long in the middle of the dorsal surface. The fifth segment is 1½ mm. in length. The sixth segment is as long as the first—about 2 mm. in length. The seventh segment is 1 mm. long—only half as long as the preceding segment. The post-lateral angles of the first four segments are but little produced. The post-lateral angles of the last two segments are very much produced, those of the seventh segment being more produced than those of the preceding segment. The epimera of the second, third, fourth, and fifth segments extend to the post-lateral angles of their respective segments. Those of the second and third segments are rounded posteriorly. Those of the fourth and fifth segments are obtusely pointed. The epimera of the sixth and seventh segments are very acutely produced and extend to the posterior margins of their respective segments, but not to the post-lateral angles. The first five segments of the abdomen are subequal and all visible in a dorsal view, the first segment not being covered by the last thoracic segment. The first two have the lateral parts produced in long acute processes on the underside, these processes not being visible from a dorsal view. The lateral parts of the other segments are not produced. The sixth or terminal segment is as wide as long—5 mm.:5 mm.—and is longer than all the five anterior segments taken together—5 mm.:4 mm. It is triangular in shape, with apex produced and rounded. The uropoda are shorter than the last abdominal segment, the inner branch being the shorter.[a]

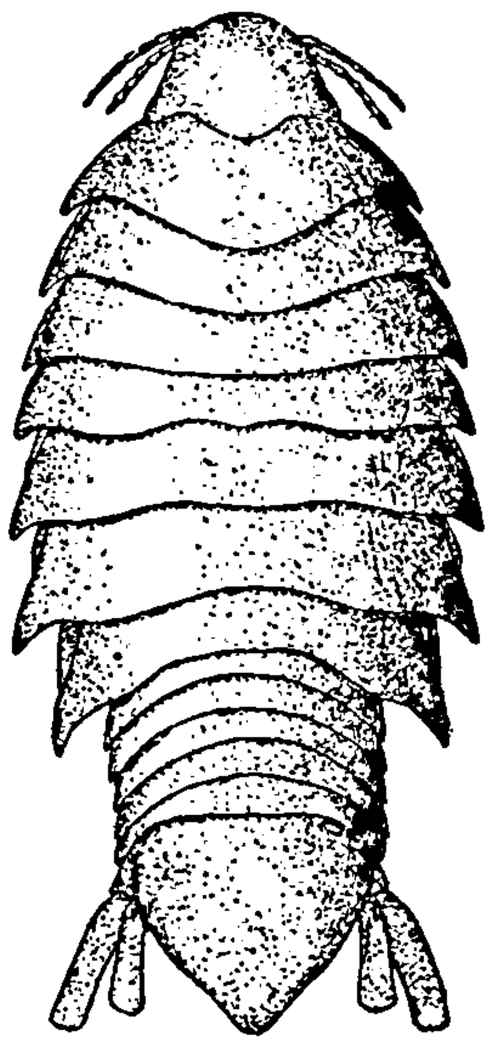

FIG. 229.—NEROCILA LANCEOLATA. × 3.

[a] The inner branch is probably broken in the specimen, for this branch is described by Say as triangular, whereas it appears truncate in the specimen.

The outer branch is a little narrower than the inner branch and rounded truncate.[a]

35. Genus ANILOCRA Leach.[b]

Body compact, rather stout. Head posteriorly produced in three lobes, not at all immersed and not constricted at the base.

Anterior margin of the first thoracic segment more or less distinctly trisinuate. Posterior angles of the first thoracic segment most always somewhat produced and prominent; those of the second, third, fourth, fifth, and sixth segments not prominent; those of the seventh segment prominent and produced. Anterior epimera almost reach or do not reach by a very short distance the posterior angle of the segment; the posterior epimera do not reach by a greater or less distance the posterior angle of the segment.

Abdomen covered at the base. Legs increase gradually in length, the last pair very often abruptly longer than the others.

ANALYTICAL KEY TO THE SPECIES OF THE GENUS ANILOCRA.

a. Head produced, with sides sinuate and roundly truncate in front. Terminal abdominal segment varying in width, either equally as long as wide or manifestly longer than wide. Uropoda much shorter than caudal segment; inner branch scarcely much longer and much wider than outer branch.

Anilocra laticauda Milne Edwards

a'. Head rounded as a circle in front. Terminal abdominal segment wider than long. Uropoda manifestly longer than terminal segment; inner branch much shorter and scarcely wider than outer branch.

Anilocra plebeia Schiœdte and Meinert

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[a] The above description is from a dried specimen, the type, in the collection of the Philadelphia Academy. Say's description is as follows:

Body oblong-oval; head broader than long; tail dilated, lanceolate, carinate, equal to the six preceding segments conjunctly.

Inhabits—

Cabinet of the Academy.

Body, the transverse less than half of the longitudinal diameter; segments narrower before and rounded, acute behind; edge not thickened; *antennæ* not robust; *abdomen*, segments suddenly narrower than the thoracic segments, subequal, the posterior ones gradually narrower; *terminal segment* dilated, lanceolate, a transverse impressed line at base, longitudinally carinated, carina obsolete toward the base, inner terminal joint of the lateral appendices triangular, outer one linear somewhat obliquely truncated at tip.

Length, three-fourths of an inch. Found cast on the beach of Cumberland Island, Georgia.—Say, Journ. Acad. Nat. Sci. Phila., I, 1818, pp. 397–398.

[b] See Schiœdte and Meinert for characters of genus, Nat. Tidsskr. (3), XIII, 1881–83, pp. 100–101.

ANILOCRA LATICAUDA Milne Edwards.

Anilocra laticauda Milne Edwards, Hist. Nat. Crust., III, 1840, p. 259.
Anilocra mexicana Saussure, Rev. Mag. Zool., 1857, p. 505.
Anilocra leachii (Krøyer) Schiœdte, Natur. Tidsskrift (3), IV, 1866, p. 205, pl. xi, figs. 2a–2g.
Anilocra laticauda Schiœdte and Meinert, Naturhistorisk Tidsskrift (3), XIII, 1881–83, pp. 126–131, pl. ix, figs. 1–3.—Richardson, American Naturalist, XXXIV, 1900, p. 221; Proc. U. S. Nat. Mus., XXIII, 1901, p. 528.—Moore, Report U. S. Commissioner of Fish and Fisheries, XX, Pt. 2, 1902, p. 172, pl. x, figs. 3–4.

Localities.—From Maryland to the Straits of Magellan; Maryland; Key West; St. Anna, Mexico; Cozumel, Yucatan; Habana, Cuba; St. Thomas; St. Croix; St. Bartolomew; Rio de Janeiro, Brazil; Sandy Point, in Straits of Magellan; Porlamar, Margarita Island, Venezuela; Arroyo and Vieques, Porto Rico.

Parasite of *Hæmulon plumieri;* also of *Upeneus martinicus.*

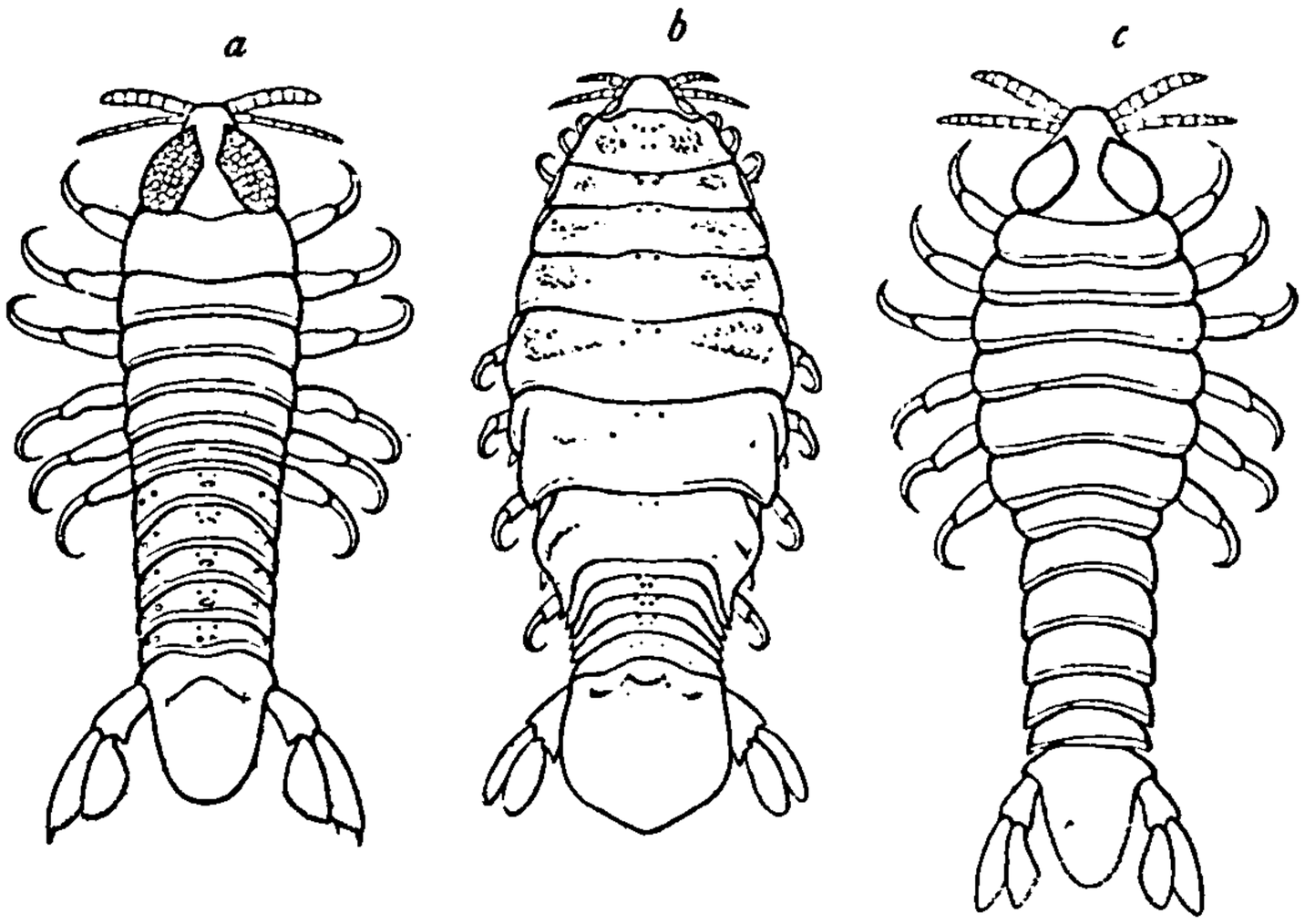

Fig. 230.—Anilocra laticauda (After Schiœdte and Meinert). *a*, Young of the second stage. *b*, Adult female. *c*, Young of the first stage. (All enlarged.)

Body oblong-ovate, nearly two and a half times longer than wide, 14 mm.: 34 mm. Body widest at the fifth thoracic segment.

Head wider at the base than long, 3 mm.: 5 mm., somewhat triangular in shape, becoming gradually narrower toward the anterior extremity, which is produced to a narrow, pointed apex, bending downward over the antennæ, separating the basal articles, and extending on the ventral side to the mouth parts. From a dorsal view the anterior margin is 2 mm. wide and is truncate. The eyes are large, oval, twice as long as wide, composite, and situated in the post-lateral angles of the head. The head is not at all set in the first thoracic segment. The first pair of antennæ are composed of eight articles, and extend to the end of the fifth article of the second pair of antennæ. The basal articles are not contiguous, but are separated by a distance of ½ mm., the width of the frontal process at this point. The second

pair of antennæ are composed of ten articles and extend beyond the middle of the first thoracic segment. The maxillipeds have a palp of two articles. The palp of the mandibles is composed of three articles.

The first and fourth segments of the thorax are subequal and each is 3 mm. in length; the second and third are subequal and each is 2 mm. long; the fifth and sixth are each 4 mm. in length; the seventh is 2½ mm. long. The epimera are distinctly separated on the last six segments. Those of the second and third segments extend the full length of the lateral margin; those of the fourth and seventh segments extend one-half of the lateral margin; those of the fifth and sixth extend one-third of the lateral margin. The first two are rounded posteriorly; the last four have the outer post-lateral angles acutely produced.

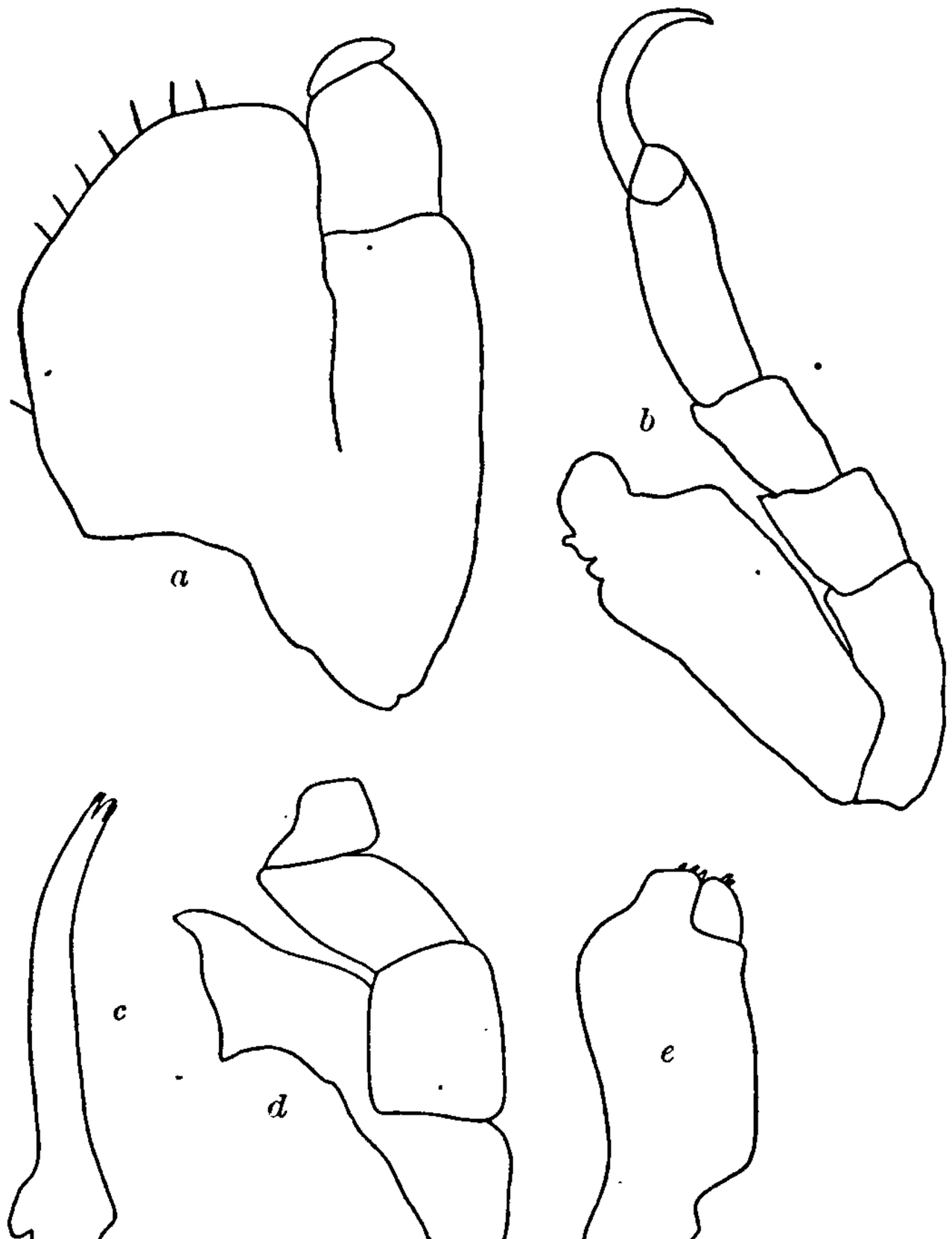

FIG. 231.—ANILOCRA LATICAUDA. *a*, MAXILLIPED. × 27⅓. *b*, SEVENTH LEG. × 27⅓. *c*, FIRST MAXILLA. × 27⅓. *d*, MANDIBLE. × 27⅓. *e*, SECOND MAXILLA. × 27⅓.

The first segment of the abdomen is as wide as the seventh thoracic segment. The abdomen is not set in the thorax and all the segments are distinct. The second, third, fourth, and fifth segments become gradually somewhat narrower. The sixth or terminal segment is not wider at the base than the fifth segment; it is widely rounded posteriorly, and is as long as wide, 7 mm.: 7 mm. The uropoda are as long as the terminal abdominal segment, are of equal length and width, and are rounded posteriorly.

All the legs are prehensile with long, narrow, curved dactyli, those of the second and third pairs being much longer than the others. The last pair of legs are longer than any of the others. There is a very low carina on the basis of the last four pairs of legs.[a]

[a] See Schiœdte and Meinert for complete description of this form, the adult female, the young of the first stage, and the young of the second stage, Nat. Tidsskr. (3), XIII, 1881–1883, pp. 126–131.

ANILOCRA PLEBIA Schiœdte and Meinert.

Anilocra plebia SCHIŒDTE and MEINERT, Naturhistorisk Tidsskrift (3), XIII, 1881–1883, pp. 145–146, pl. x, fig. 3.—RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 528.

Localities.—Shores of Costa Rica; Central America.

Body elliptical, two or three times longer than wide (9:4). Head moderately large, subtriangular, one-third as wide as the fourth thoracic segment, much wider than long, very slightly immersed, the front rounded in a circle.

Eyes small, suboval, tumid, separated by a distance of more than half the width of the head.

The first pair of antennæ are straight, rather compressed, and extend with the two last articles to the anterior angle of the first thoracic segment and to the sixth article of the second pair of antennæ; they are composed of eight articles.

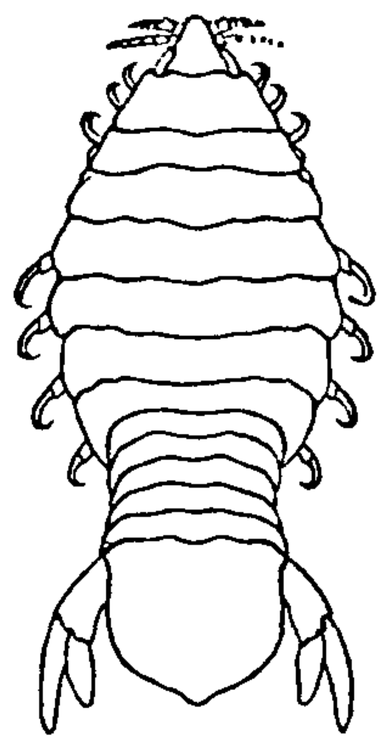

FIG. 232.—ANILOCRA PLEBIA (AFTER SCHIŒDTE AND MEINERT). YOUNG FEMALE. (ENLARGED.)

The second pair of antennæ are rather compressed, are a little narrower than the first pair of antennæ, and do not reach the posterior angle of the first thoracic segment; they are composed of nine articles.

The anterior margin of the first thoracic segment is manifestly trisinuated, the lateral sinuses being scarcely deeper than the median sinus.

The posterior angles of the first six segments of the thorax are scarcely or not at all produced, being rounded or obtuse. The posterior angles of the seventh segment are a little more produced and rounded. The angles of the seventh segment do not reach by a small distance the posterior angle of the first segment of the abdomen.

The epimera are projecting. The first three are rather wide or rather narrow, decreasing gradually in width, with the posterior margin widely rounded. The three posterior ones are narrow, subequal in width, with the posterior margin narrowly rounded. The epimera of the first and second pairs extend almost to the posterior angle of the segment; those of the third pair do not reach by a small distance the posterior angle of the segment; the fourth, fifth, and sixth pairs of epimera are subequal and do not reach by a large distance the posterior angle of the segment.

The first six pairs of legs gradually increase a little in length; those of the last pair are manifestly longer and a little more slender than the others. The ungulæ of the first pair are rather long and rather stout; those of the second, third, fourth, and fifth pairs are long or very long, rather stout, subequal in length; those of the sixth pair are long or

rather long and rather stout; those of the seventh pair are rather short and slender.

The abdomen is covered at the base, is more than one and a half times longer than wide (8:5), and is much shorter than the thorax with the head (4:3). The first five segments gradually increase a little in length. The sides of the first five segments are a little roundly dilated, excavate, or emarginate; the first and second segments are obliquely truncated; the third, fourth, and fifth segments are gradually more deeply and more angularly emarginate.

The terminal segment of the abdomen is cordate, impressed at the base, obscurely carinated, much wider than long (6:5), manifestly longer than the other segments of the abdomen taken together (10:9). The uropoda are manifestly longer than the terminal abdominal segment (9:8); the inner branch is very much shorter and scarcely wider than the exterior branch, becoming narrower back of the middle, sublaminar, scarcely surpassing the apex of the last segment; the exterior branch is narrow, sickle-shaped.

Length 21.5 mm.

Color from gray to green, yellow on the terminal abdominal segment and the uropoda.[a]

36. Genus OLENCIRA Leach.

Body relaxed, rather stout, more or less distorted.

Head constricted at the base. First pair of antennæ separated at the base, rather compressed. Second pair of antennæ compressed. Eyes manifest.

Anterior margin of the first thoracic segment manifestly trisinuated. The posterior angles of the first six segments of the thorax not pro-

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[a] The above description is adapted from the following one of Schiœdte and Meinert's:

Elliptica, bis vel ter longior quam latior (9:4).

Caput mediocre, subtriangulum, quam annulus quartus trunci ter angustius, multo latius quam longius, levissime immersum, fronte in orbem rotundata. Oculi parvi, subovalis, tumidi, plus quam dimidia parte latitudinis capitis distantes. Antennæ primi paris subrectæ, compressiusculæ; angulum priorem annuli primi trunci articulis binis ultimis superantes, articulum sextum antennarum secundi paris explentes; 8-articulatæ.

Antennæ secundi paris compressiusculæ, quam antennæ primi paris paulo angustiores, angulum posticum annuli primi trunci non attingentes; 9-articulatæ.

Margo anticus annuli primi trunci manifesto trisinuatus, sinubus lateralibus quam sinu medio vix profundioribus.

Anguli postici annulorum sex priorum trunci vix vel non prominuli, rotundati vel obtusi; annuli septimi paulum prominuli, rotundati. Anguli annuli septimi angulum posticum annuli primi caudalis spatio parvo non attingentes.

Epimera subpendula; terna priora latiuscula vel angustiuscula, per paria sensim latitudine decrescentia, margine postico late rotundato; terna posteriora angusta, latitudine subæqualia, margine postico breviter rotundato. Epimera paris primi et secundi angulum annuli fere explentia; paris tertii angulum annuli spatio parvo non