

The first three pairs of legs are prehensile and have the propodus in the first pair armed with five spines, the carpus with one and the merus with eleven long spines and many short ones on the inferior margin, and one long one at the outer distal angle, and the ischium armed with one spine. In the second and third pairs the propodus

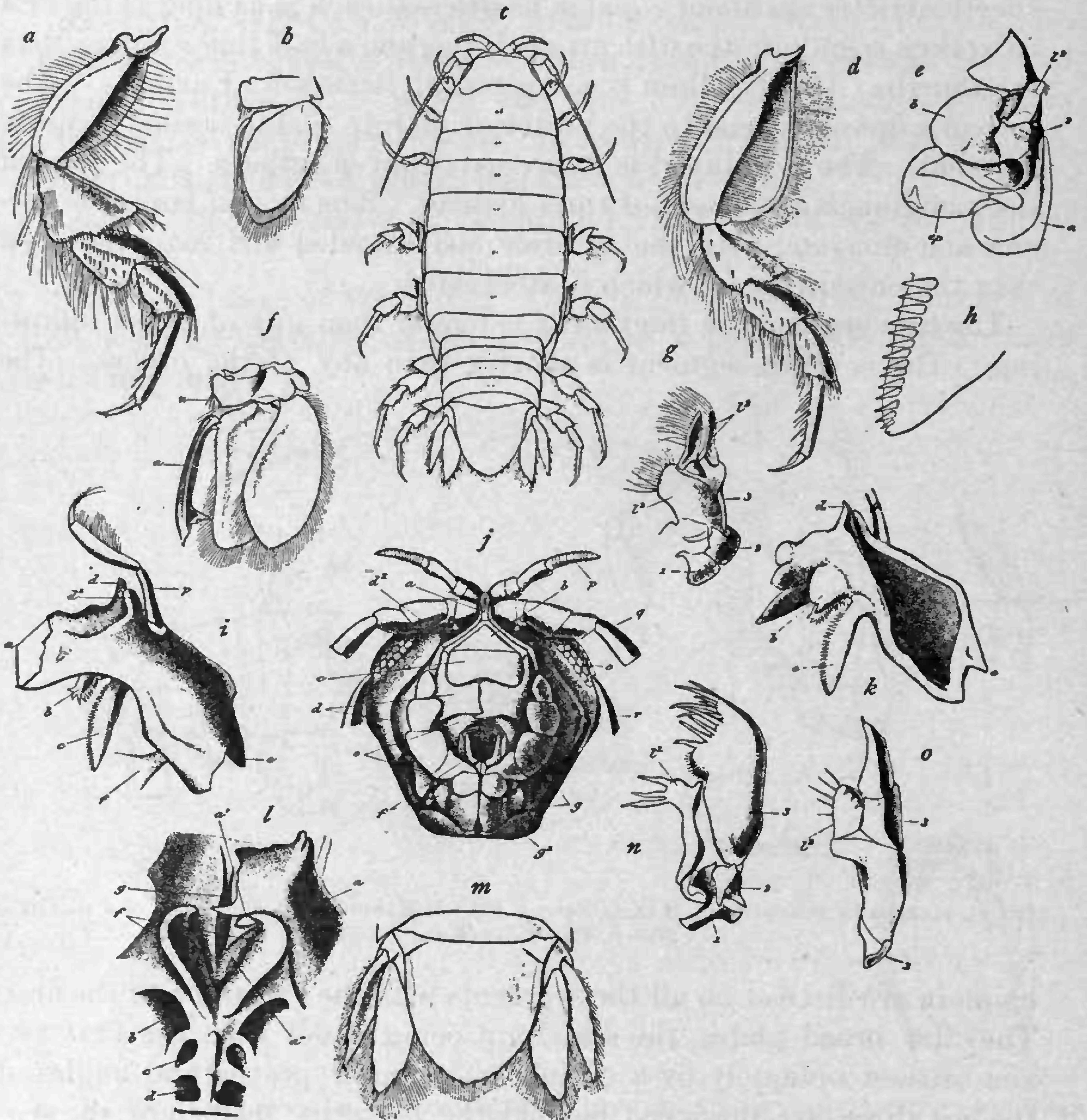


FIG. 85.—*Cirolana borealis* (AFTER HANSEN). *a*, LEG OF FIFTH PAIR. *b*, LEFT PLEOPOD OF SECOND PAIR OF YOUNG MALE. *c*, DORSAL VIEW OF MALE. *d*, LEG OF SEVENTH PAIR. *e*, THREE BASAL ARTICLES OF LEFT MAXILLIPED OF FEMALE. *f*, LEFT PLEOPOD OF SECOND PAIR OF ADULT MALE. *g*, LEFT MAXILLA OF SECOND PAIR OF MALE. *h*, DISTAL PART OF MOLAR PROCESS OF MANDIBLE. *i*, MANDIBLE (LEFT SIDE). *j*, HEAD OF MALE (VENTRAL VIEW). *k*, MANDIBLE (RIGHT SIDE). *l*, MIDDLE PART OF HEAD, RIGHT MANDIBLE, MAXILLÆ AND MAXILLIPEDS OMITTED. *m*, POSTERIOR PART OF ABDOMEN OF MALE. *n*, LEFT MAXILLA OF FIRST PAIR. *o*, BASAL PART OF LEFT MAXILLIPED. (ENLARGED.)

is armed with two spines, the carpus with three long spines and five short ones, the merus with six long spines and three short ones on the inner margin and three long ones at the outer distal end, and the ischium with three spines. The last four pairs of legs are ambulatory and furnished with numerous spines.

CIROLANA GRACILIS Hansen.

Cirolana gracilis HANSEN, Vidensk. Selsk. Skr. (6), V, 1890, pp. 329-331, pl. II, figs. 2-2g.—RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 513.

Locality.—St. Thomas, West Indies.

Body more than three times longer than wide, somewhat convex.

Front produced forward in a process a little wider and shorter than in *C. borealis*.

Eyes large, brownish, seen from the side almost as wide as long, with the superior margin short and straight; the ocelli are few and large, rather convex on the superior side, somewhat convex on the inferior side.

The frontal lamina is very narrow, becoming narrower toward the apex, with the lateral margins disappearing anteriorly but manifest posteriorly.

The clypeus is scarcely shorter than the labrum with the anterior, posterior, and lateral margins elevated and with a median rib, enclosing two impressed, reticulate areas.

The first pair of antennæ are a little stouter than in *C. borealis*, and extend a little beyond the apex of the fourth article of the peduncle of the second pair of antennæ.

The second pair of antennæ reach the posterior margin of the fourth thoracic segment; the peduncle has the third article scarcely longer than the fourth, and a little shorter than the fifth; the flagellum is composed of about twenty-six articles.

The mandibles and the maxillipeds are almost as in *C. borealis*.

The thoracic segments are subequal in length; the first segment is scarcely shorter than the head and a little longer than the fifth segment; the seventh segment is rather long.

The epimera are a little narrower than in *C. neglecta*, otherwise formed as in that species with furcæ.

The first three pairs of legs are formed almost as in *C. borealis*, nevertheless they are somewhat more slender and furnished with a few hairs and a few spines mostly longer.

The last four pairs of legs are more slender than in *C. borealis*, and are rather different from them. The fifth pair of legs are elongated, are somewhat longer than the seventh pair of legs, and a little shorter than the sixth pair of legs; the second article is formed as in *C. borealis* with simple hairs arranged in three series; the other articles are somewhat more slender than in *C. borealis* and ornamented with hairs and a few spines; the fourth article is rather dilated; the fifth article is quite dilated and furnished everywhere on the superior side with a few spines. The fourth pair of legs are rather short. The seventh pair of legs are rather different; the second article is flattened and

very much elongated, about two and a half times longer than wide, with the exterior margin thickly furnished with plumose hairs, the middle margin furnished with a few simple hairs, the interior margin bare, the apical margin furnished with numerous very long, plumose hairs; the other articles are simple, scarcely dilated, shorter, and furnished with very few hairs. The sixth pair of legs differ but little from the fifth pair of legs.

The first five segments of the abdomen and the pleopods have the usual structure.

The last segment of the abdomen is more than a half wider than long, having in the middle near the base a transverse depression, the

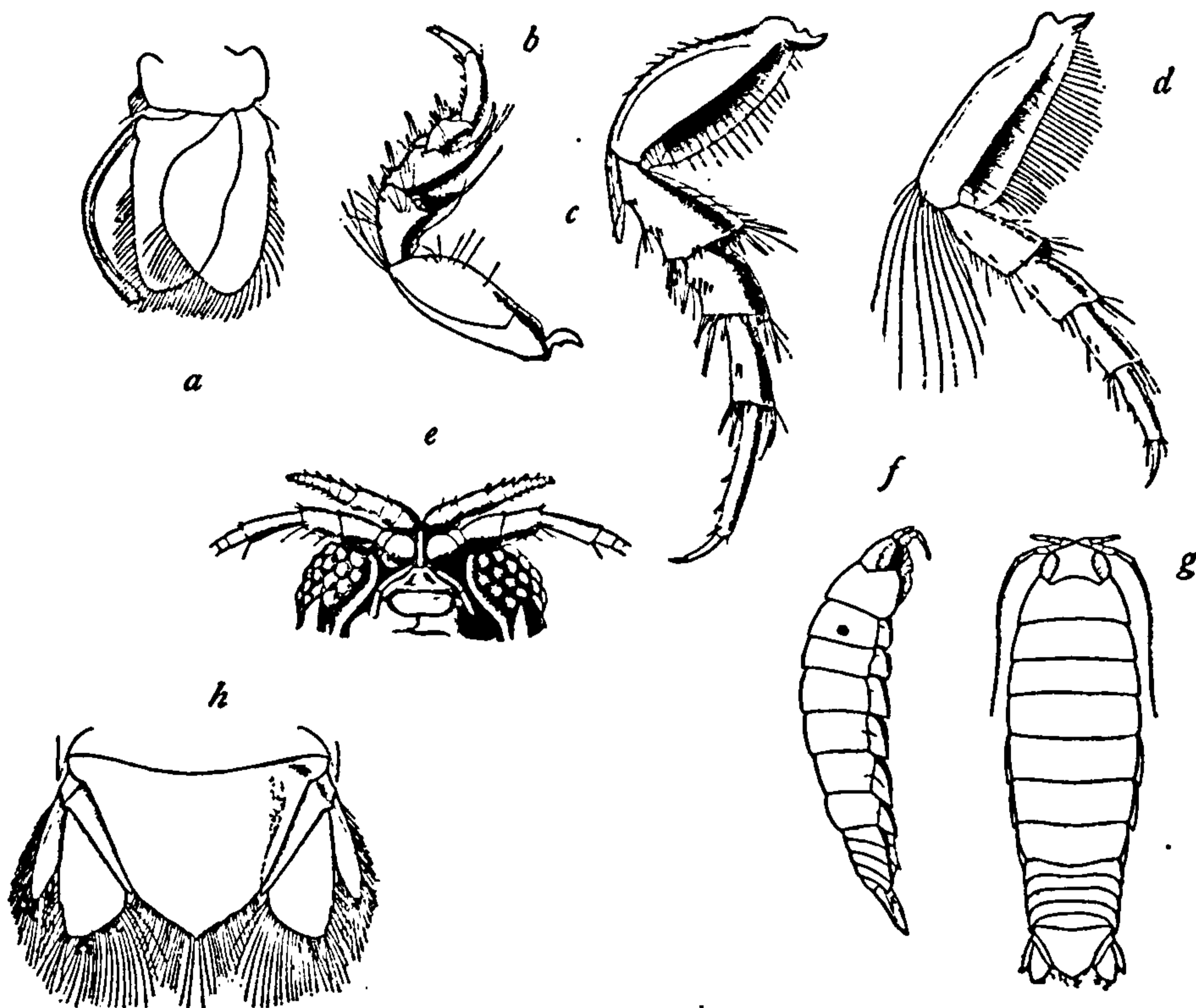


FIG. 86.—*CIROLANA GRACILIS* (AFTER HANSEN). *a*, LEFT PLEOPOD OF SECOND PAIR. *b*, LEG OF SECOND PAIR. *c*, LEG OF SEVENTH PAIR. *d*, LEG OF FIFTH PAIR. *e*, ANTERIOR PART OF HEAD. *f*, LATERAL VIEW OF MALE. *g*, DORSAL VIEW OF ADULT MALE. *h*, POSTERIOR PART OF ABDOMEN. (ENLARGED.)

margins posteriorly being obliquely truncate and ornamented with about eight spines and long hairs, the apex acute.

The uropoda are rather short; the inner branch is scarcely twice as long as wide, extending somewhat beyond the abdomen, being a little longer than the exterior branch and much narrower, with the posterior margin much shorter than the anterior margin, the apex scarcely acute; both branches are furnished with a few small spines and hairs, mostly long, and longer than in the preceding species (*C. neglecta*); the peduncle has the inner angle strongly produced, extending a long distance beyond the middle of the inner branch.

The color of an old specimen is yellowish brown.

The male appendage is long, curved almost like a semicircle, extending beyond the apex of the inner branch, almost of equal width and thickness throughout, with apex rounded.^a

^aThe above description is adapted from the following one of Hansen's:

Diagn. Oculi brunnescentes, a latere visi fere æque lati ac longi, ocellis paucioribus, superioribus sat convexis, inferioribus aliquantum convexis. Clypeus ad medium area biimpressa et pulchre sculpta ornatus. Epimera omnia furca arcuata, manifesta et furca marginali ornata. Pedes quinti paris pedibus septimi paris nonnihil longiores, graciliores, articulo secundo circiter duplo longiore quam latiore. Pedes septimi paris graciliores, articulo secundo valde elongato et complanato circiter duplo et dimidio longiore quam latiore. Segmentum ultimum caudæ postice marginibus valde in obliquum truncatis, spinis c. 8 ornatis, apice acuto. Uropoda ramis valde inæqualibus; ramus interior haud duplo longior quam latior, caudam nonnihil superans, ramo exteriori parvo et angusto multo longior. Long. specim. sing. 8 mm.

Corpus plus triplo longius quam latius, aliquantum convexum. Frons prona in processum, paulo latiore et brevior quam in *C. boreali*, producta.

Oculi majores, brunnescentes, a latere visi fere æque lati ac longi, margine superiore brevior, recto; ocelli pauciores et majores, in latere superiore satis convexi, in latere inferiore aliquantum convexi.

Lamina frontalis angustissima, ad apicem versus angustata, marginibus lateralibus ante evanidis, postice manifestis.

Clypeus labro vix brevior, margine et ante et in lateribus et postice et costa media elevatis, areas duas impressas, reticulatas cingentibus.

Antennulæ paulo crassiores quam in *C. boreali*, paulum ultra apicem articuli quarti antennarum pedunculi prominentes.

Antennæ marginem posteriorem segmenti quarti trunci attingentes; pedunculus articulo tertio vix longiore quam quarto et paulo brevior quam quinto; flagellum c. 26—articulatum.

Mandibulæ et maxillipedes fere ut in *C. boreali*.

Segmenta trunci longitudine minus inæqualia; segmentum primum capite vix brevius et segmento quinto paulo longius; segmentum septimum longius.

Epimera paulo angustiora quam in *C. neglecta*, ceteroquin ut in illa specie formata et furcata.

Pedes parium trium anteriorum fere ut in *C. boreali* formati, tamen nonnihil graciliores, setis paucioribus et spinis paucioribus et ex parte longioribus instructi.

Pedes quattuor parium posteriorum graciliores quam in *C. boreali* et ab eis sat diversi. Pedes quinti paris elongati, pedibus septimi paris nonnihil longiores et pedibus sexti paris perpaulo breviores; articulus secundus ut in *C. boreali* formatus, setis in series tres dispositis simplicibus; articuli ceteri aliquanto graciliores quam in *C. boreali*, setis et spinis minus numerosis ornati; articulus quartus sat dilatatus, articulus quintus perpaulum dilatatus, uterque in latere superiore spinis paucis ornatus. Pedes quarti paris sat breves. Pedes septimi paris sat aberrantes; articulus secundus complanatus et valde elongatus, circiter duplo et dimidio longior quam latior, margine exteriori setis densis plumosis, margine medio setis paucis simplicibus, margine interiore nudo, margine apicali setis compluribus perlongis, plumosis instructo; articuli ceteri simplices, vix dilatati, breviores, setis perpaucis instructi. Pedes sexti paris a pedibus quinti paris paulum diversi. Segmenta quinque anteriora caudæ et pleopoda structura solita.

Segmentum ultimum caudæ plus dimidio latius quam longius, ad medium prope basin magis in transversum impressum postice marginibus valde in obliquum truncatis, spinis c. 8 et ciliis longis ornatis, apice acuto.

Uropoda sat brevia; ramus interior haud duplo longior quam latior, caudam nonnihil superans, ramo exteriori parvo et angusto multo longior, margine posteriore

CIROLANA OBTRUNCATA Richardson.

Cirolana obtruncata RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 514.—
MOORE, Report U. S. Commissioner of Fish and Fisheries, XX, Pt. 2, 1902,
p. 167, pl. VIII, figs. 9-12.

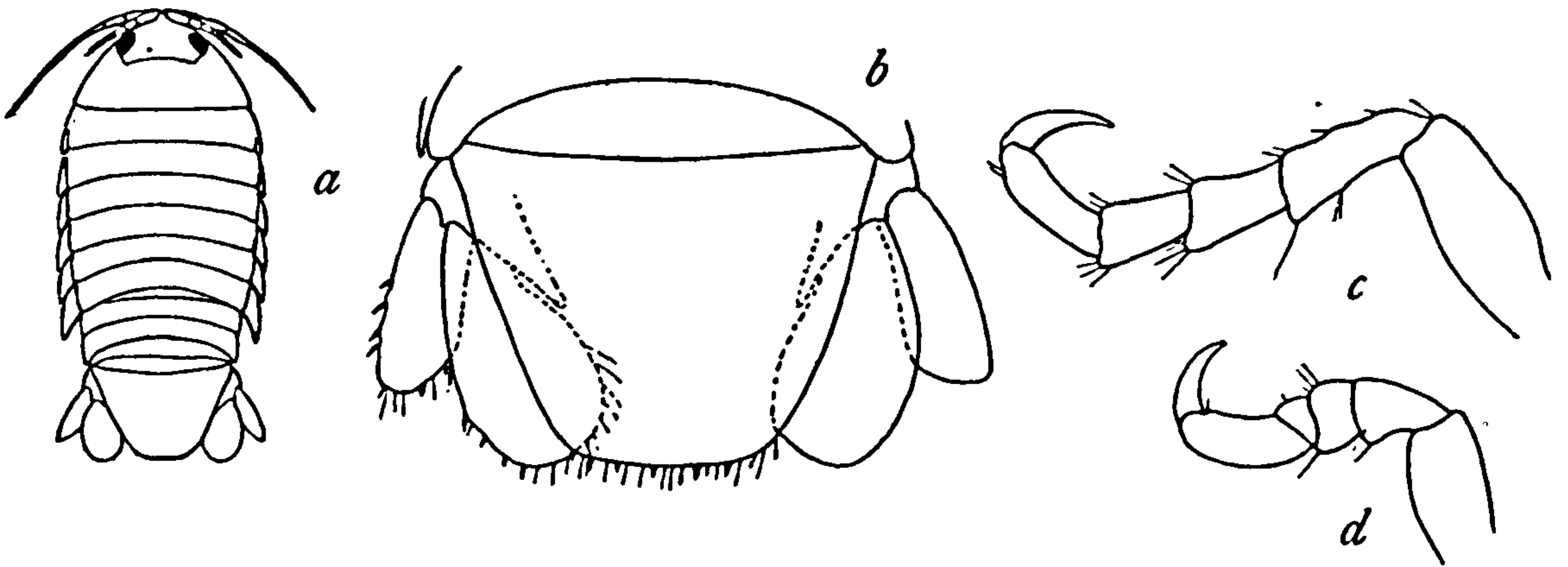


FIG. 87.—CIROLANA OBTRUNCATA (AFTER MOORE). *a*, GENERAL FIGURE. *b*, ABDOMEN (LAST SEGMENT WITH UROPODA). *c*, SEVENTH LEG. *d*, FIRST LEG.

Localities.—Kingston, Jamaica; Fajardo, Porto Rico; a third specimen is in the collection of the U. S. National Museum from unknown locality.

Head transversely oval. Eyes small, lateral. First pair of antennæ short, reaching a little beyond the posterior margin of the head; flagellum, twelve jointed.

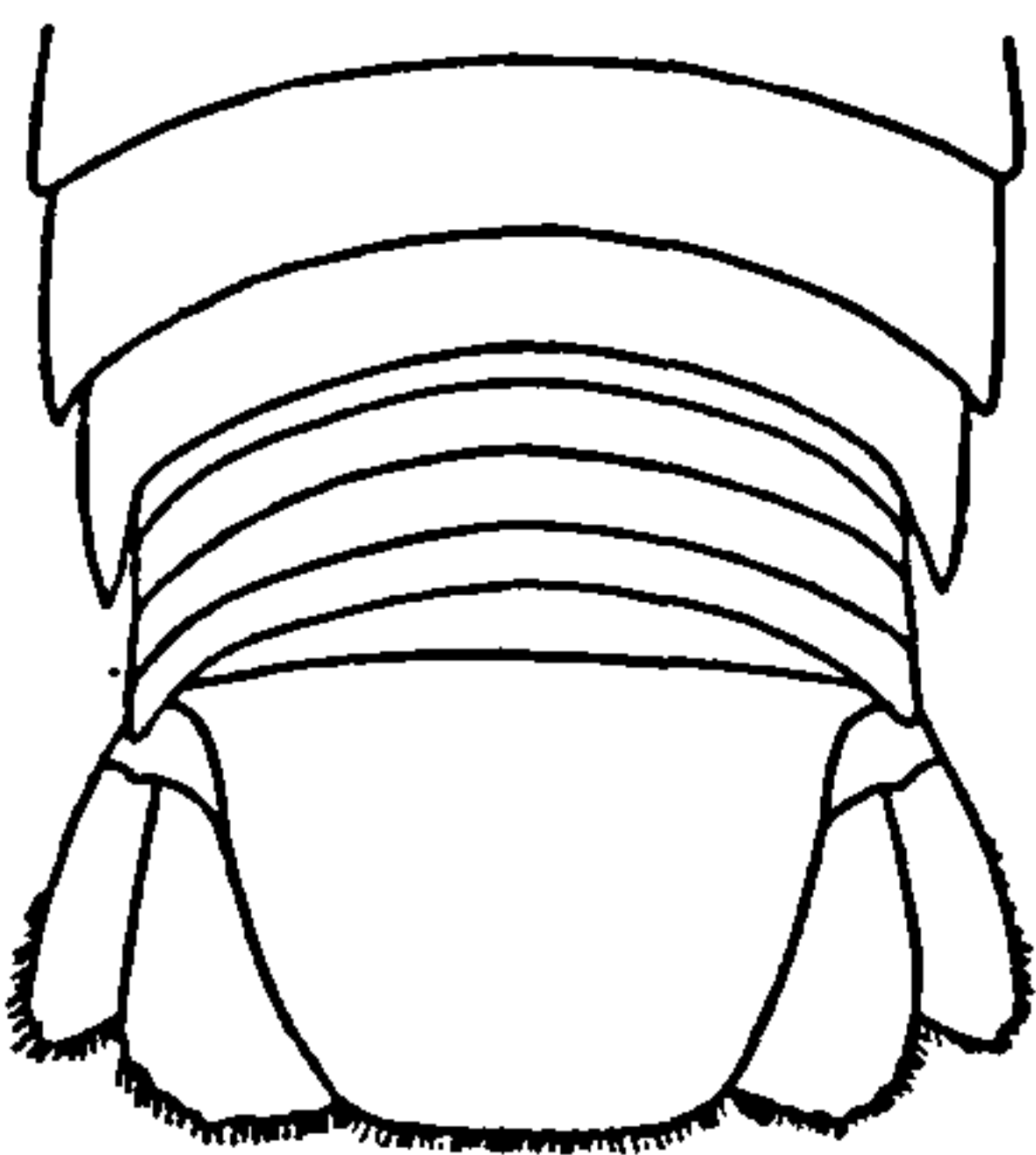


FIG. 88.—CIROLANA OBTRUNCATA. ABDOMEN AND LAST TWO THORACIC SEGMENTS.

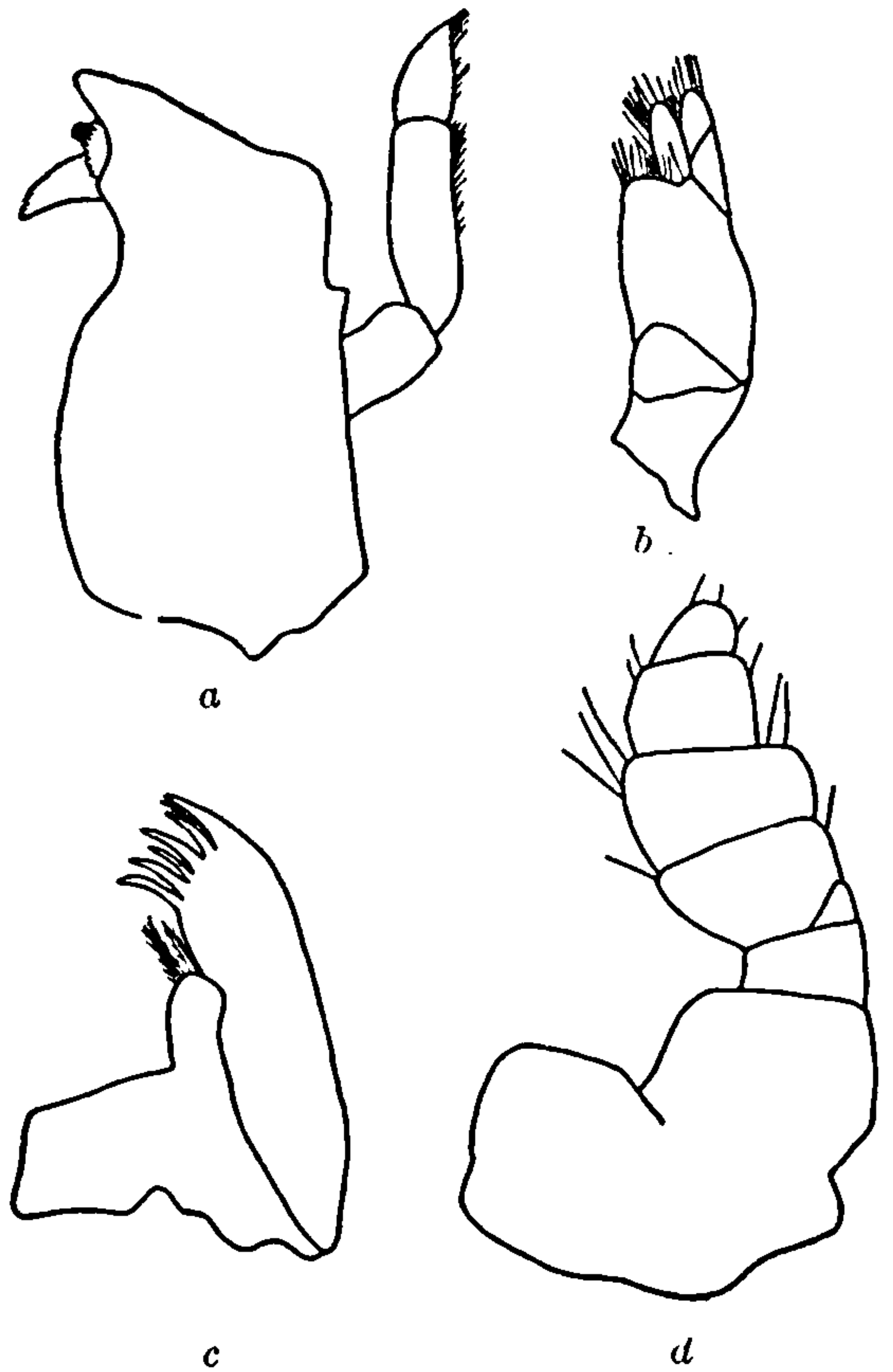


FIG. 89.—CIROLANA OBTRUNCATA. *a*, MANDIBLE. *b*, SECOND MAXILLA. *c*, FIRST MAXILLA. *d*, MAXILLIPED. ALL $\times 51\frac{1}{2}$.

quam margine anteriore multo brevior, apice vix acuto; ramus uterque spinis parvis paucioribus et ciliis ex parte longis et longioribus quam in speciebus præcedentibus instructus; scapus angulo interiore valde producto, longe ultra medium ramum interiorem prominente.

Color in specimine vetere flavo-brunnescens.

Appendix masculina longa, fere semicirculariter curvata, ultra apicem rami interioris prominens, ubique latitudine et crassitudine fere æquali, apice rotundato.—HANSEN, Vidensk. Selsk. Skr. (6), V, 1890, pp. 329-331.

Second pair of antennæ reach the middle of the third thoracic segment; flagellum, twenty-one jointed.

Thoracic segments subequal; first one somewhat longer than others. Epimera of second, third, and fourth segments posteriorly rounded; of fifth, sixth, seventh, and eighth segments pointed posteriorly.

First abdominal segment partly covered by last thoracic segment, following four segments subequal; terminal segment with its posterior margin truncate and minutely crenulate.

Uropoda not longer than posterior margin of terminal segment; inner branch longer and broader than outer branch, and crenulate. Both branches rounded posteriorly.

Color, brown.

Type specimen from Kingston, Jamaica; taken from surface.

Type.—Cat. No. 23901, U.S.N.M.

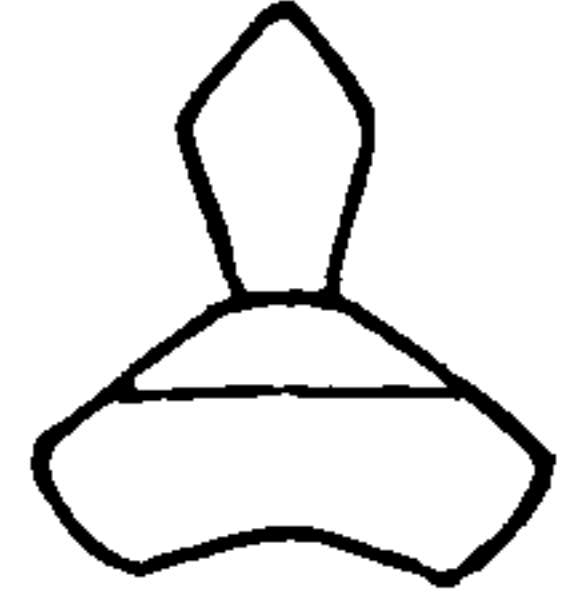


FIG. 90.—CIROLANA OBTUNCATA. FRONTAL LAMINA, CLYPEUS, AND LABRUM (DIAGRAMMATIC).

CIROLANA HARFORDI (Lockington.)

Ega harfordi LOCKINGTON, Proc. Cal. Acad. Sci., VII, 1877, Pt. 1, p. 46.

Cirolana californica HANSEN, Vidensk. Selsk. Skr. (6), V, 1890, pp. 338-339.—CALMAN, Ann. N. Y. Acad. Sci., XI, 1898, p. 274.

Cirolana harfordi RICHARDSON, Proc. U. S. Nat. Mus., XXI, 1899, pp. 822-823; Ann. Mag. Nat. Hist. (7), IV, 1899, p. 163; American Naturalist, XXXIV, 1900, p. 217.—HARRIMAN Alaska Expedition, Crustacea, X, 1904, p. 213; Proc. U. S. Nat. Mus., XXVII, 1904, p. 658.—HOLMES, Proc. Cal. Acad. Sci. (3), III, 1904, pp. 319-321.

Localities.—Victoria, British Columbia; California; Santa Rosa Island; San Diego; Catalina Harbor; Pacific Grove; Monterey Bay; Lower California; Wilson Cove, California; Santa Cruz, California; Farallones, California; San Pedro, California.

Body oblong-ovate, a little more than twice as long as wide, $3\frac{1}{2}$ mm: 8 mm.

Head wider than long, 1 mm.: 2 mm. with the anterior margin widely rounded. The eyes are small, round, composite, and situated in the antero-lateral angles of the head. The first pair of antennæ have the first two articles about equal in length; the third is twice as long as the second. The flagellum is composed of ten articles. The first 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, and subequal; the third is a little longer than the second; the fourth is twice as long as the third; the fifth is a little longer than the fourth. The flagellum is composed of thirty-three articles. The second antennæ extend to the posterior margin of the fifth thoracic segment. The maxillipeds are composed of seven articles. The mandible has a palp of three articles.

The frontal lamina is conspicuous, short and broad, with the anterior margin somewhat triangulate.

The first segment of the thorax is twice as long as any of the others, which are subequal. The epimera are distinct on all the segments with the exception of the first. Those of the last two segments have the outer post-lateral angle produced beyond the posterior margins of the segments. A carina crosses all the epimera, being oblique in the last four and longitudinal in the first two.

The first two segments of the abdomen are entirely concealed by the seventh thoracic segment. The sixth or terminal segment is attenuated posteriorly, with the apex rounded, and furnished with eighteen spines placed close together. The inner branch of the uropoda is as

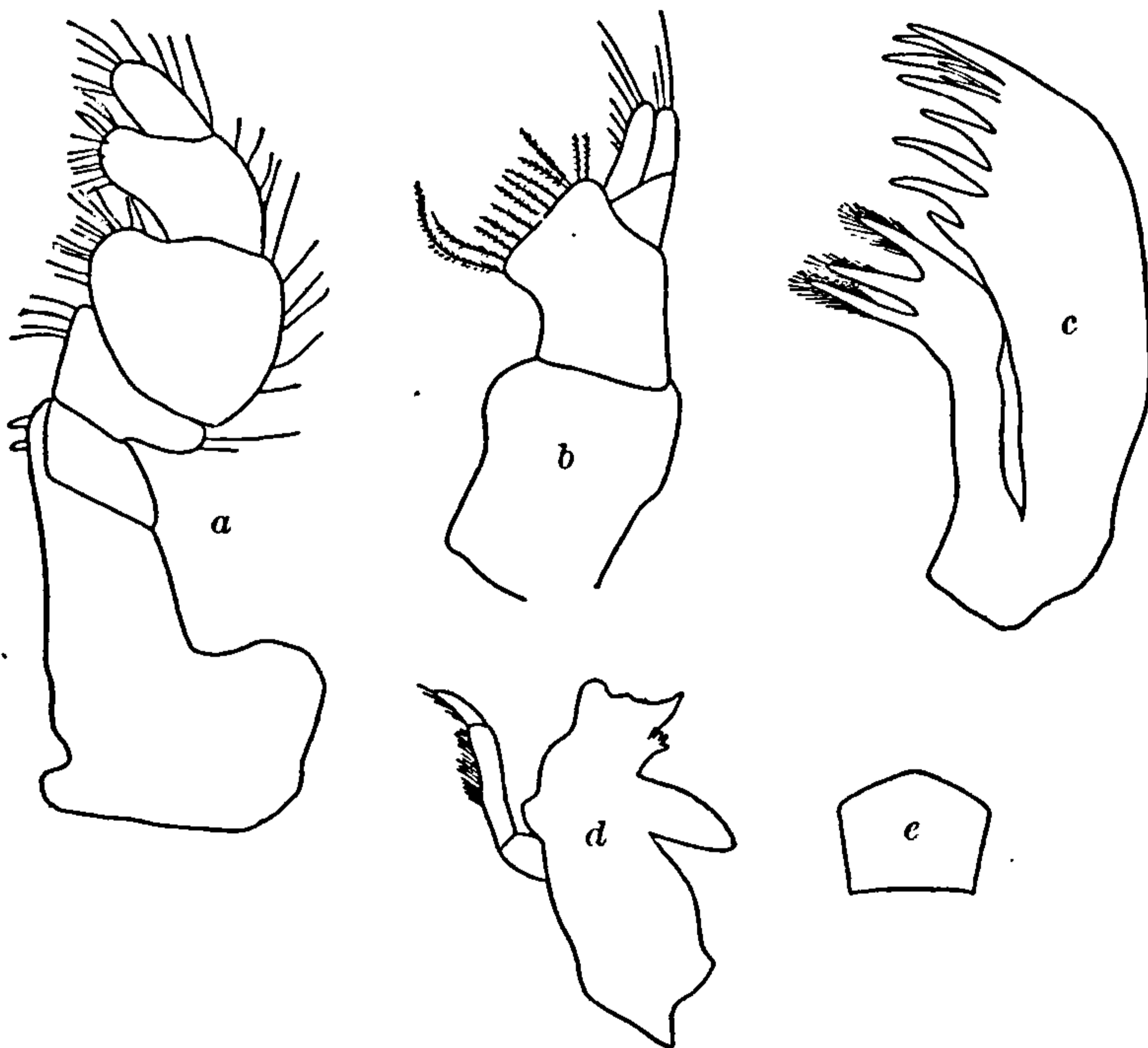


FIG. 91.—*Cirolana harfordi*. *a*, MAXILLIPED. $\times 27\frac{1}{2}$. *b*, SECOND MAXILLA. $\times 51\frac{1}{2}$. *c*, FIRST MAXILLA. $\times 51\frac{1}{2}$. *d*, MANDIBLE. $\times 27\frac{1}{2}$. *e*, FRONTAL LAMINA. $\times 51\frac{1}{2}$.

long as the terminal segment of the body. It is broad posteriorly, with the posterior margin and the distal end of the exterior margin armed with spines. The outer branch is almost as long as the inner branch, is narrower and rounded posteriorly, and has its margins armed with spines. The peduncle of the uropoda has the inner angle produced to extend two-thirds the length of the last abdominal segment.

The first three pairs of legs are prehensile, the last four pairs ambulatory. In the first pair there are three spines on the propodus, one on the carpus, three small sharp ones on the merus, and six large blunt ones, one long slender, pointed one, and one large blunt one on the ischium, with another long stout spine at the outer distal end. On the second and third pairs there is an additional spine on the propodus, three spines on the carpus, nine spines on the merus, with a small

spine at the outer distal end, two spines on the ischium, with a long spine at the outer distal extremity.

The specimen described is a very small one. The larger specimens have a greater number of spines on the terminal abdominal segment. The number of spines varies from sixteen to twenty-six, twenty to twenty-two being the average number.

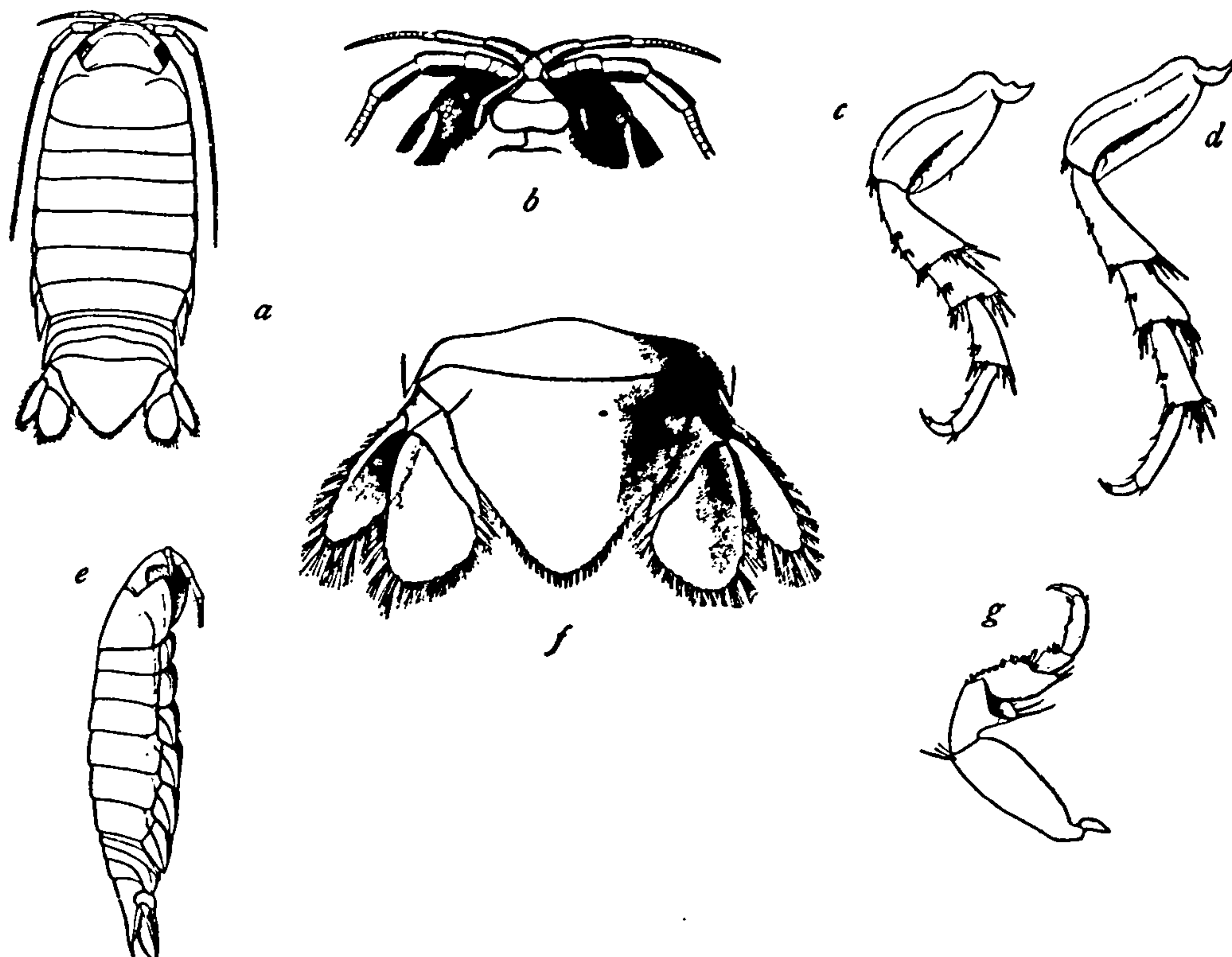


FIG. 92.—*CIROLANA HARFORDI* (AFTER HANSEN). *a*, DORSAL VIEW OF FEMALE. *b*, ANTERIOR PART OF HEAD. *c*, FIFTH LEG. *d*, SEVENTH LEG. *e*, LATERAL VIEW OF FEMALE. *f*, POSTERIOR PART OF ABDOMEN, *g*, SECOND LEG. (ENLARGED.)

CIROLANA PARVA Hansen.

Cirolana parva HANSEN, Vidensk. Selsk. Skr. (6), V, 1890, pp. 340-341, pl. II, figs. 6-6b; pl. III, figs. 1-1d.—RICHARDSON, American Naturalist, XXXIV, 1900, p. 217; Proc. U. S. Nat. Mus., XXIII, 1901, p. 514.—MOORE, Bull. U. S. Fish Comm., XX, Pt. 2, 1902, p. 167, pl. VIII, figs. 6-8.

Localities.—Key West, Florida; Gulf of Mexico; St. Thomas, West Indies; St. Croix, West Indies; between the delta of the Mississippi and Cedar Keys, Florida; Andros Island, Bahamas; between Nassau and Andros, Bahamas; Georgetown, Bahamas.

Depth.—25-27 fathoms.

Among algæ, below low tide; banks, low tide.

Body compact, oblong-ovate, nearly three times longer than wide, 3 mm.: 8 mm.

Head wider than long, 1 mm.:2 mm., with the anterior margin widely rounded and produced in a small median point, which arches over the antennæ to meet the frontal lamina on the other side. The eyes are small, round, composed of many ocelli, and situated in the

antero-lateral angles of the head. The first pair of antennæ have the first two articles subequal and difficult to distinguish; the third is twice as long as the second. The flagellum is composed of twelve

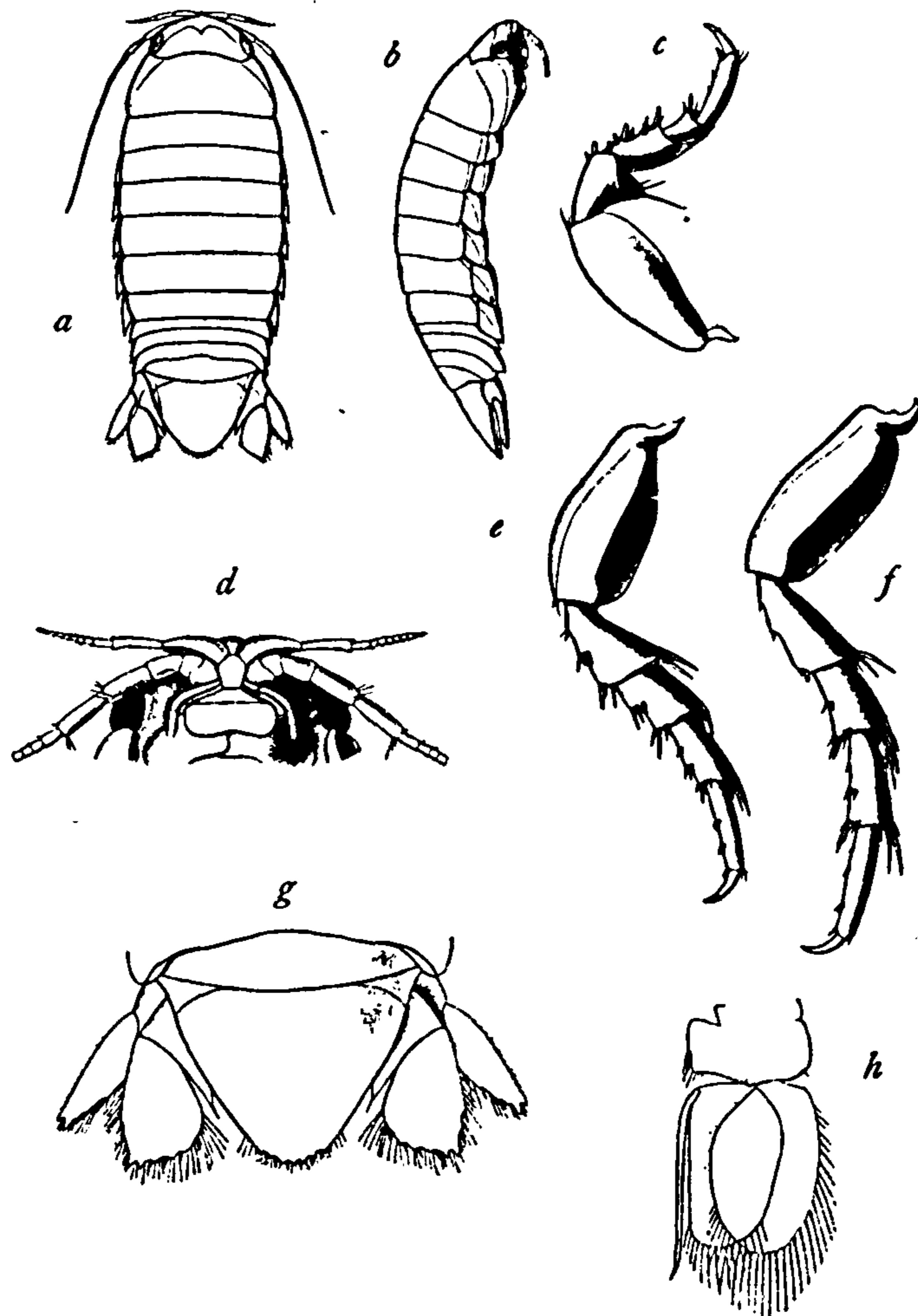


FIG. 93.—*CIROLANA PARVA* (AFTER HANSEN). *a*, ADULT MALE. *b*, LATERAL VIEW OF SAME. *c*, SECOND LEG. *d*, ANTERIOR PART OF HEAD (VENTRAL VIEW). *e*, FIFTH LEG. *f*, SEVENTH LEG. *g*, POSTERIOR PART OF ABDOMEN. *h*, LEFT PLEOPOD OF SECOND PAIR. (ENLARGED.)

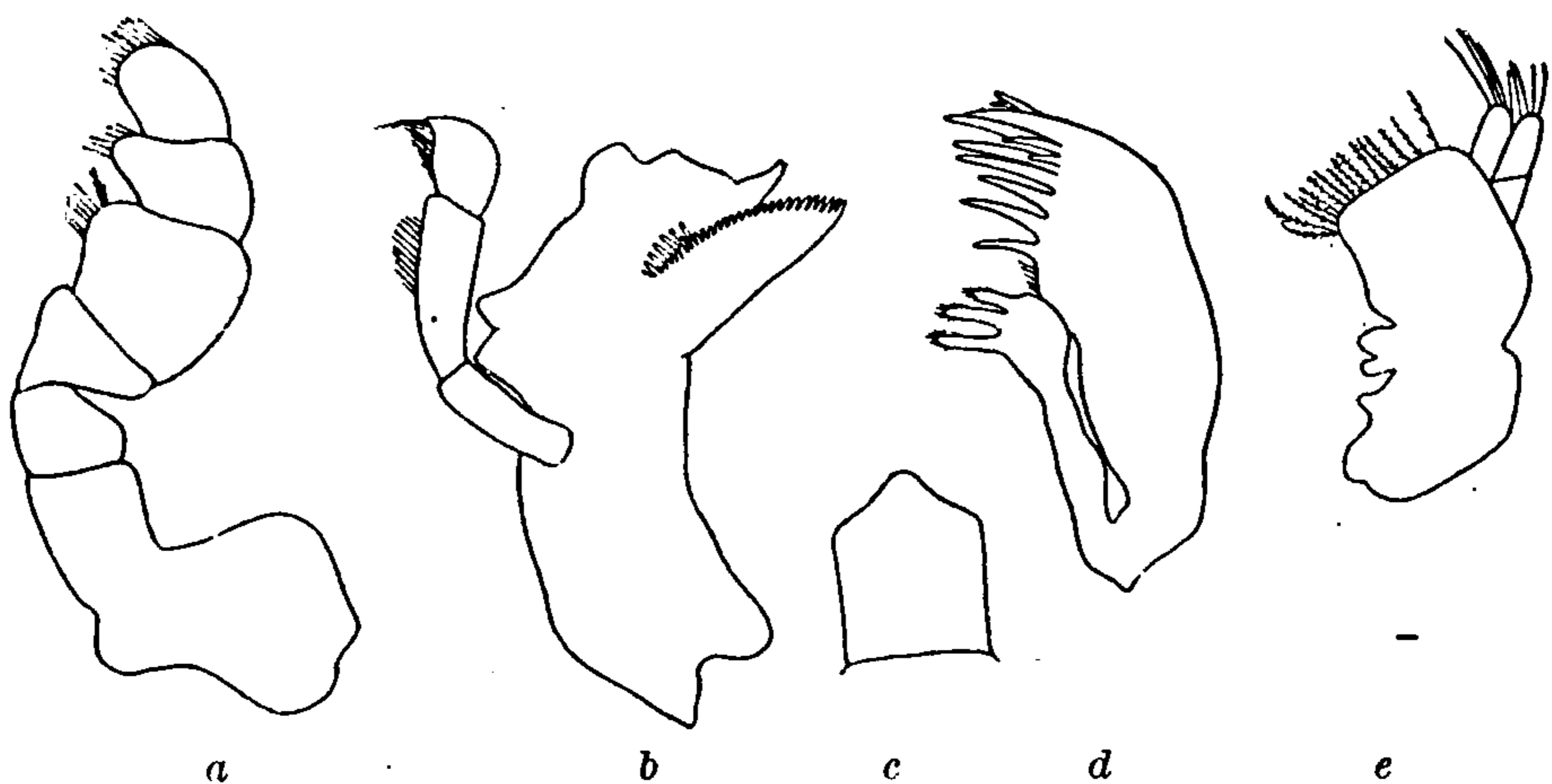


FIG. 94.—*CIROLANA PARVA*. *a*, MAXILLIPED. $\times 51\frac{1}{2}$. *b*, MANDIBLE. $\times 51\frac{1}{2}$. *c*, FRONTAL LAMINA. $\times 51\frac{1}{2}$. *d*, FIRST MAXILLA. $\times 51\frac{1}{2}$. *e*, SECOND MAXILLA. $\times 51\frac{1}{2}$.

articles. The first antennæ extend to the posterior margin of the head or to the end of the peduncle of the second pair of antennæ.

The second antennæ have the first two articles short and subequal; the third is a little longer than the second; the fourth and fifth are

subequal and each is about twice as long as the third. The flagellum is composed of thirty-two articles. The second pair of antennæ extend to the fourth thoracic segment. The maxilliped is composed of seven articles. The palp of the mandibles is composed of three articles. The frontal lamina is broad and has the anterior margin triangularly produced, the apex being rounded and meeting the anterior portion of the median point of the front of the head.

The first thoracic segment is twice as long as any of the other segments, which are subequal. The epimera are distinct on all the segments with the exception of the first. The last four are crossed by an oblique carina, the first two by a longitudinal carina. The last four are also broader than the first two and have the outer postlateral angle more acute, it being produced in the last two beyond the posterior margin of the segments.

The first segment of the abdomen is entirely concealed by the seventh thoracic segment. The sixth or terminal segment is produced in a rounded extremity, which is crenulate and furnished with eight spines. The inner branch of the uropoda is wide and is produced beyond the extremity of the abdomen; its posterior end is obliquely truncate, and crenulate with the outer postlateral angle acutely produced in two prominent teeth; the outer margin is faintly crenulate; both margins are furnished with spines. The outer branch is half as wide as the inner branch, is somewhat shorter, and is acutely produced in two prominent teeth. The peduncle extends to the inner post-lateral angle of the inner branch.

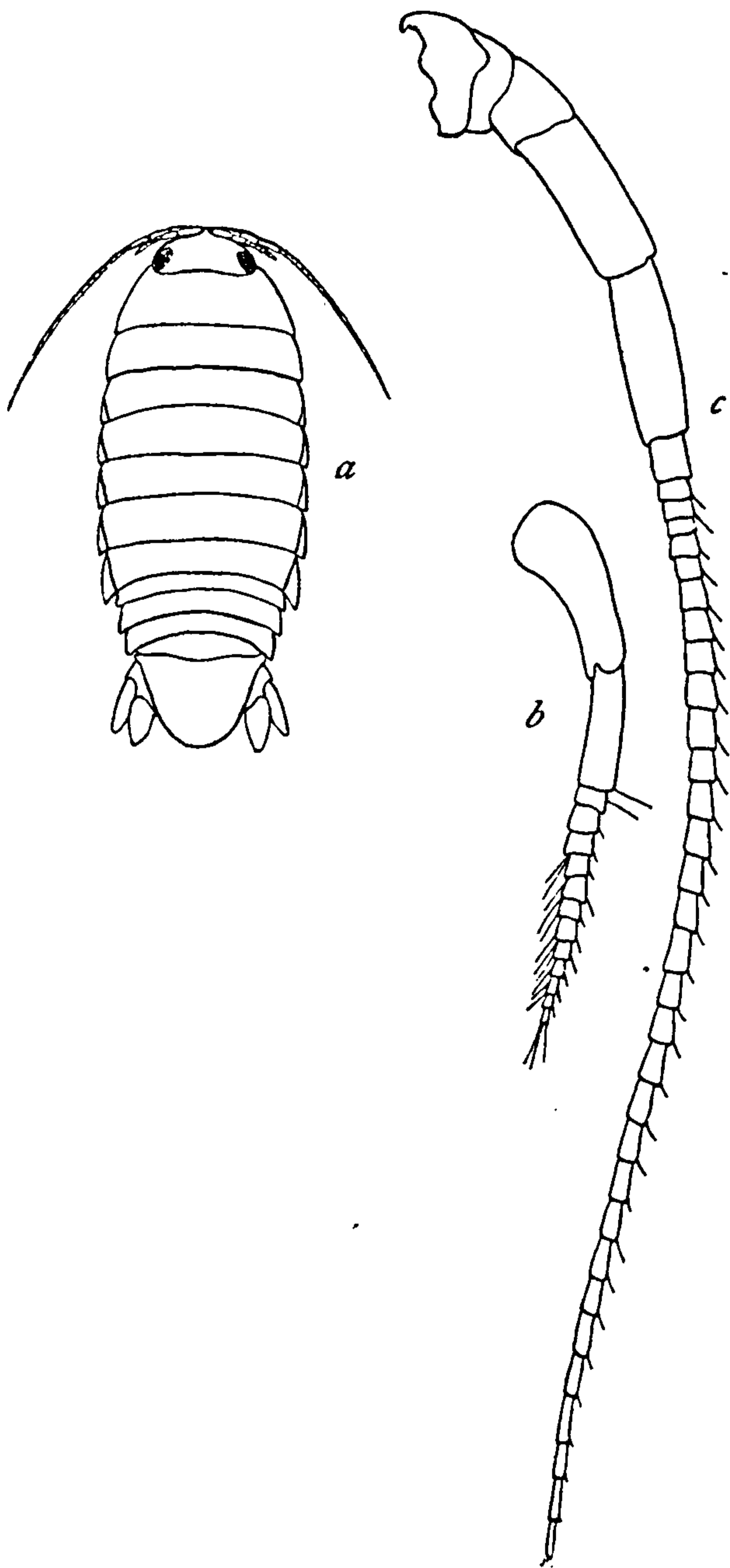


FIG. 95.—CIROLANA PARVA (AFTER MOORE). *a*, GENERAL FIGURE. $\times 53$. *b*, FIRST ANTENNA. $\times 33$. *c*, SECOND ANTENNA. $\times 33$.

The first three pairs of legs are prehensile. The propodus is armed with one spine; the merus with five blunt ones. In the second and third pairs of legs the spines on the merus are sharper, and there is also a long spine at the outer distal extremity; the ischium is, moreover, furnished with one spine. In the third pair there is also a spine on the carpus. The ambulatory legs are beset with spines.

CIROLANA ALBIDA Richardson.

Cirolana albida RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, pp. 514-515.

Locality.—Sugarloaf Key, Florida.

This species is rather doubtful and may have to be suppressed, but until further evidence is furnished it may be allowed to stand for the present. It is very close to *Cirolana parva*.

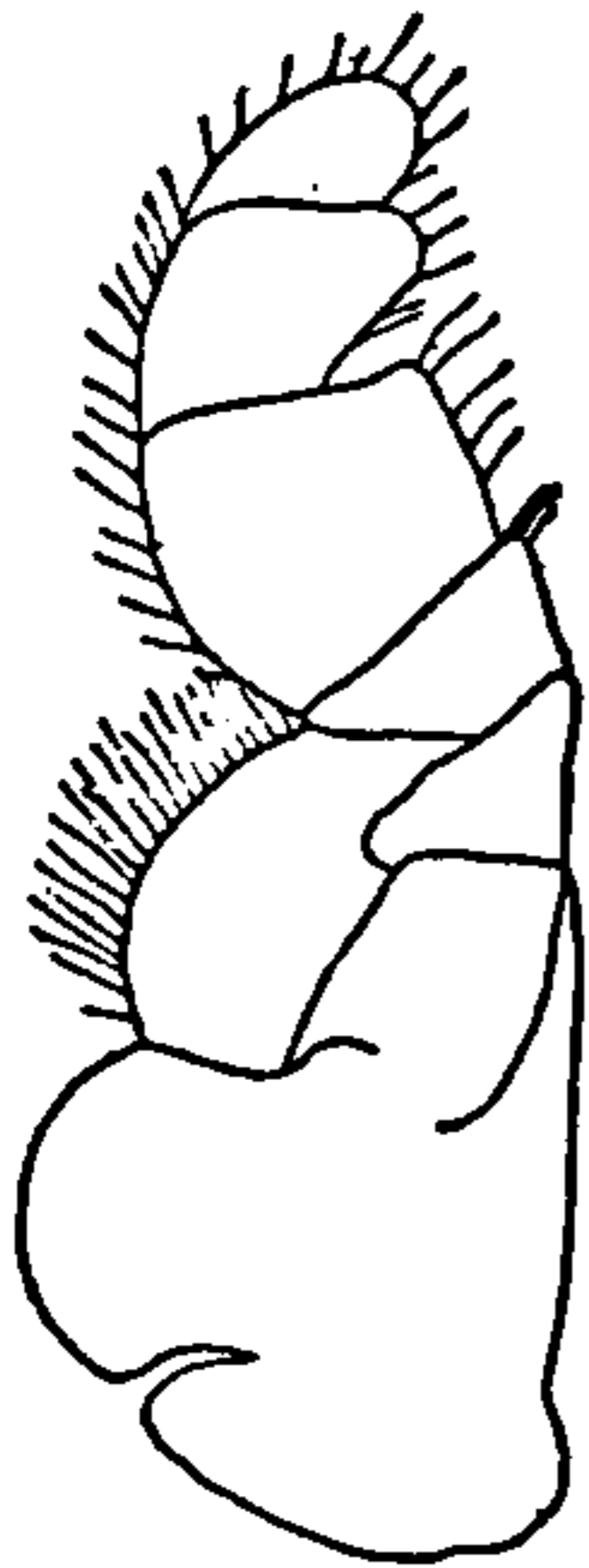


FIG. 96.—CIROLANA ALBIDA. MAXILLIPED. $\times 39$.

Body narrow, relaxed, elongate, three and two-thirds times longer than broad. Head transverse; eyes large, black. First pair of antennæ extend to the end of the peduncle of the second pair; flagellum nine jointed. Second pair of antennæ extend to the posterior margin of the third thoracic segment; flagellum twenty-three jointed.

First thoracic segment but little longer than those following, which are subequal in length. First abdominal segment entirely covered by seventh thoracic segment. Terminal segment triangulate with rounded extremity, its posterior margin denticulate and bearing eight spines, the spines alternating with the teeth. The uropoda reach the end of the terminal segment; the inner branch is obliquely truncate posteriorly, and armed with spines; the outer branch is shorter and more slender than the inner branch, is pointed at its extremity, and armed posteriorly and on its external margin with spines.

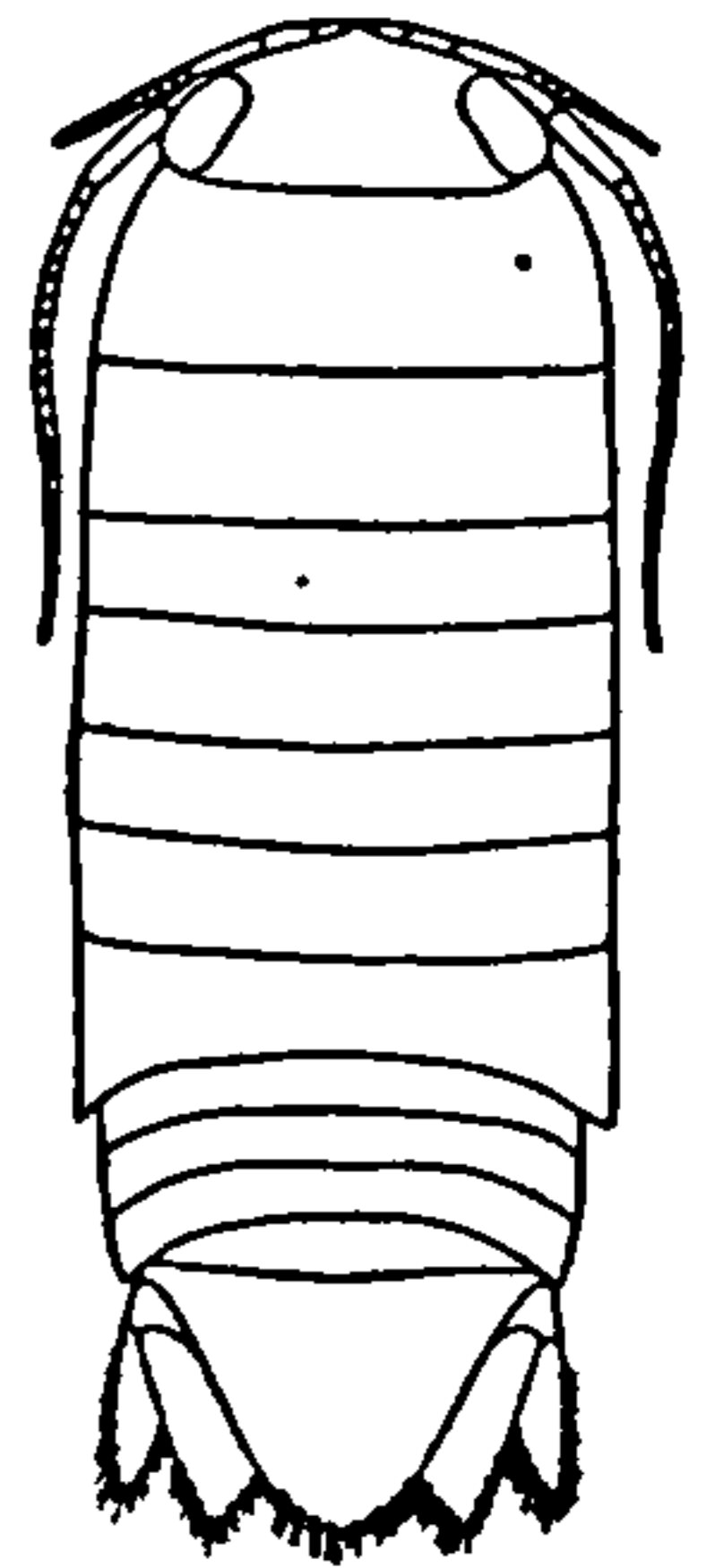


FIG. 97.—CIROLANA ALBIDA.

Color white, with scattered black spots.

Several specimens were taken by Mr. E. L. Morris at Sugarloaf Key, Florida.

Type.—Cat. No. 23902, U.S.N.M.

CIROLANA CUBENSIS Hay.

Cirolana cubensis HAY, Proc. U. S. Nat. Mus., XXVI, 1903, pp. 429-435.

Locality.—Cuba; in cavern at San Isidro.

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

Head twice as wide as long—1 mm.: 2 mm.—with the anterior margin rounded and produced in a median point. The eyes are absent.

The first pair of antennæ have the peduncle composed of only two articles, both long and narrow; the second is a little longer than the first. The flagellum is composed of fourteen articles, and extends to the posterior margin of the second thoracic segment. The second pair of antennæ have the first three articles short and subequal; the fourth and fifth articles are subequal in length, and each is as long as the first three articles taken together. The flagellum is composed of thirty articles, and extends to the middle of the fifth thoracic segment. The maxillipeds are composed of seven articles. The palp of the mandibles is composed of three articles. The frontal lamina is short and broad, with the anterior extremity rounded.

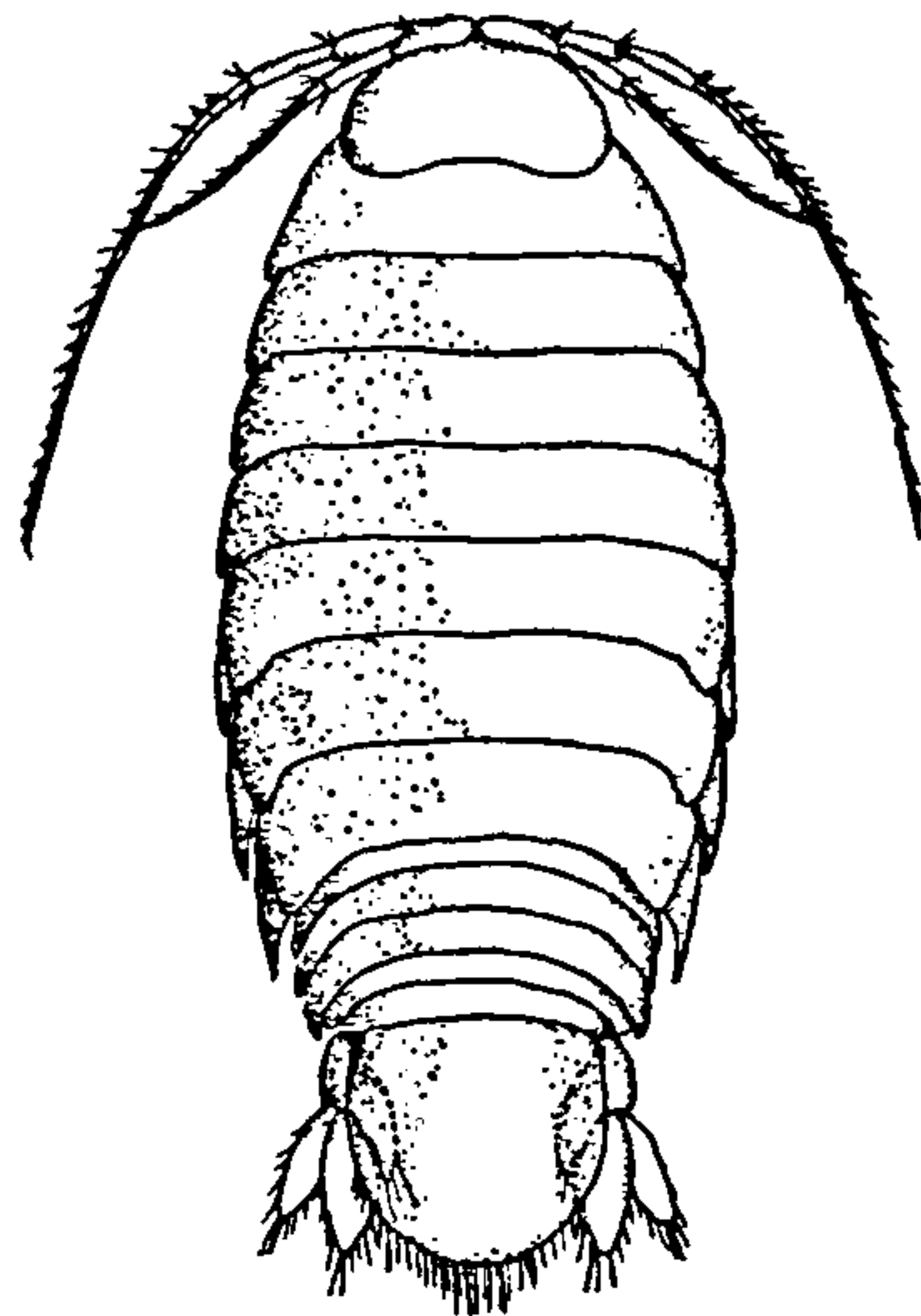


FIG. 98.—*CIROLANA CUBENSIS* (AFTER HAY).

The second, third, and fourth segments of the thorax are subequal, and each is about half as long as the first segment. The fifth, sixth, and seventh segments are subequal, and each is a little longer than any of the three preceding segments. The epimera of all the segments, with the exception of the first, are distinctly separated from the segments. The epimera of the last two segments have the outer post-lateral angle acutely produced. All are crossed by an oblique carina.

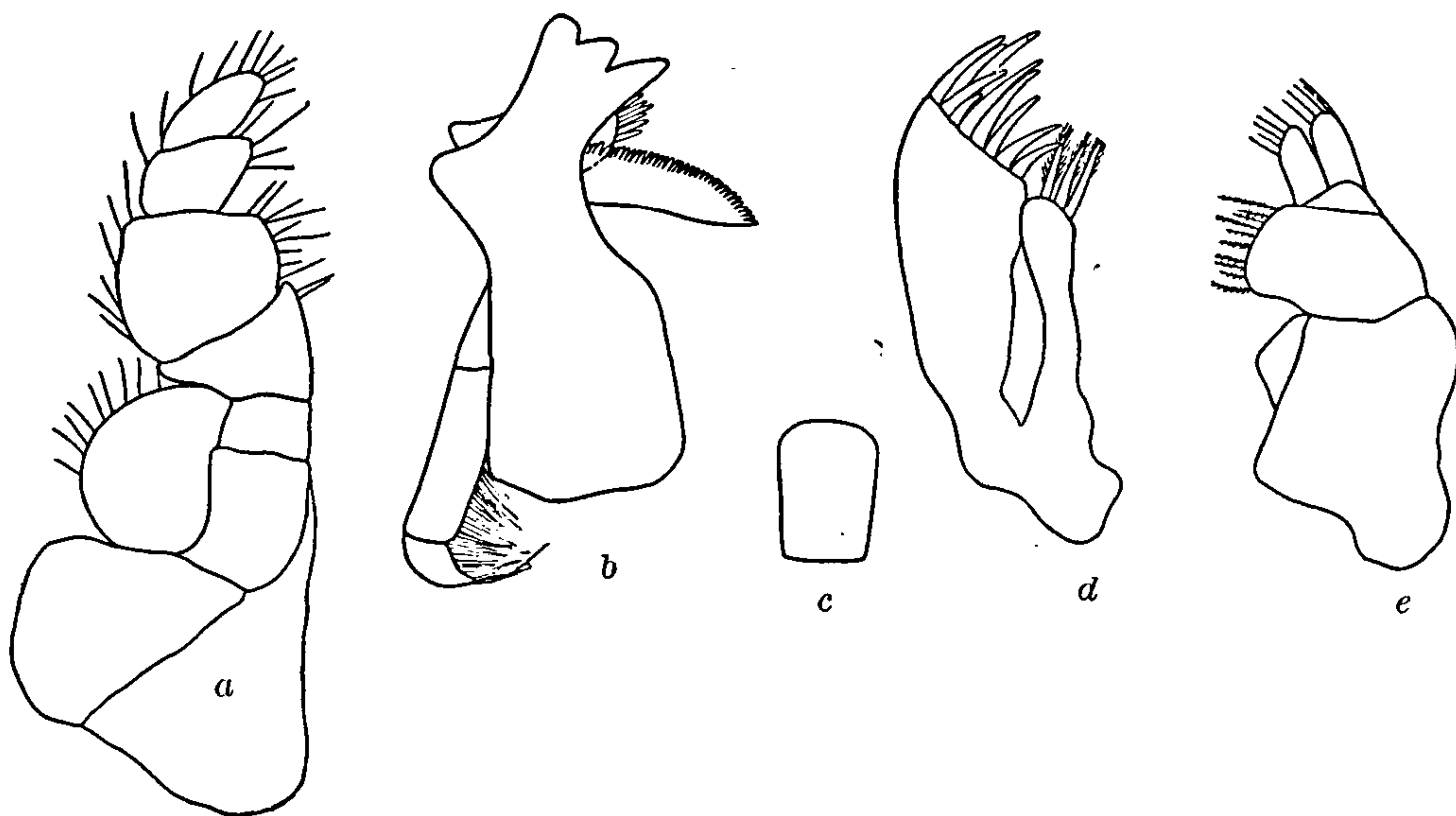


FIG. 99.—*CIROLANA CUBENSIS*. *a*, MAXILLIPED. $\times 27\frac{1}{2}$. *b*, MANDIBLE. $\times 27\frac{1}{2}$. *c*, FRONTAL LAMINA. $\times 27\frac{1}{2}$. *d*, FIRST MAXILLA. $\times 27\frac{1}{2}$. *e*, SECOND MAXILLA. $\times 27\frac{1}{2}$.

The first segment of the abdomen is entirely covered by the seventh thoracic segment, with the exception of the post-lateral angles. The terminal segment is rounded posteriorly and has the posterior margin smooth. The uropoda do not extend beyond the extremity of the abdomen. The inner branch is twice as wide as the outer branch and is posteriorly pointed. The inner branch is obliquely truncate. The

margins are smooth and furnished with hairs, as is the terminal abdominal segment. The inner angle of the peduncle of the uropoda is produced. The first pair of legs are somewhat prehensile. All the others are ambulatory.

20. Genus CONILERA Leach.^a

First pair of antennæ with basal article of peduncle not extended straight in front at right angles to remaining part of antenna. Peduncle of the second pair of antennæ composed of five articles. The plate of the second article of the maxillipeds is furnished with hooks.

The first pair of pleopods have the peduncle elongated, somewhat longer than wide, hard, and furnished on the inner side with about nine hooks; the inner branch is rather elongated, narrow, hard, with the inner margin straight, thick, almost bare, the outer margin furnished with moderately long hairs; the outer branch is shorter than the inner branch, ovate, hard, furnished with a longitudinal furrow, with the posterior margin furnished with moderately long hairs; the pleopods thus form a large operculum, covering the other pleopods. The peduncle of the second pair of pleopods is scarcely wider than long; the branches are of the usual structure.

The peduncle of the uropoda has the inner posterior angle somewhat produced.

The six segments of the abdomen are distinct.

ANALYTICAL KEY TO THE SPECIES OF THE GENUS CONILERA.

- a.* Eyes present. First pair of antennæ extend to the middle of the fifth article of the peduncle of the second pair of antennæ. The second pair of antennæ extend to the middle of the first thoracic segment. Body four times longer than wide.
Conilera cylindracea (Montagu)
- a'.* Eyes wanting. First pair of antennæ extend to the middle of the first thoracic segment. The second pair of antennæ extend to the middle of the seventh thoracic segment. Body five times longer than wide. . . *Conilera stygia* Packard

CONILERA CYLINDRACEA (Montagu).

Oniscus cylindraceus MONTAGU, Trans. Linn. Soc. Lond., VII, 1804, p. 71, pl. VI, fig. 8.

Conilera montagui LEACH, Dict. Sci. Natur., XII, 1818, p. 348.—DESMAREST, Consid. Crust., 1825, p. 304.—MILNE EDWARDS, Hist. Nat. Crust., III, 1840, p. 242.

Conilera cylindracea BATE and WESTWOOD, Brit. Sessile-eyed Crustacea, II, 1868, p. 304.—HANSEN, Vidensk. Selsk. Skr. (6), V, 1890, pp. 358-361, pl. IV, figs. 5-5c; pl. V, figs. 1-1d.—RICHARDSON, American Naturalist, XXXIV, 1900, p. 217; Proc. U. S. Nat. Mus., XXIII, 1901, p. 515.—NORMAN, Ann. Mag. Nat. Hist. (7), XIV, 1904, p. 438.

^a See Hansen for characters of genus, Vidensk Selsk. Skr. (6), V, 1890, pp. 358.

Localities.—Off South Carolina; between the Delta of the Mississippi and Cedar Keys, Florida; also Gulf of Naples; coast of England; coast of France.

Depth.—111–159 fathoms.

Off Pilchards.

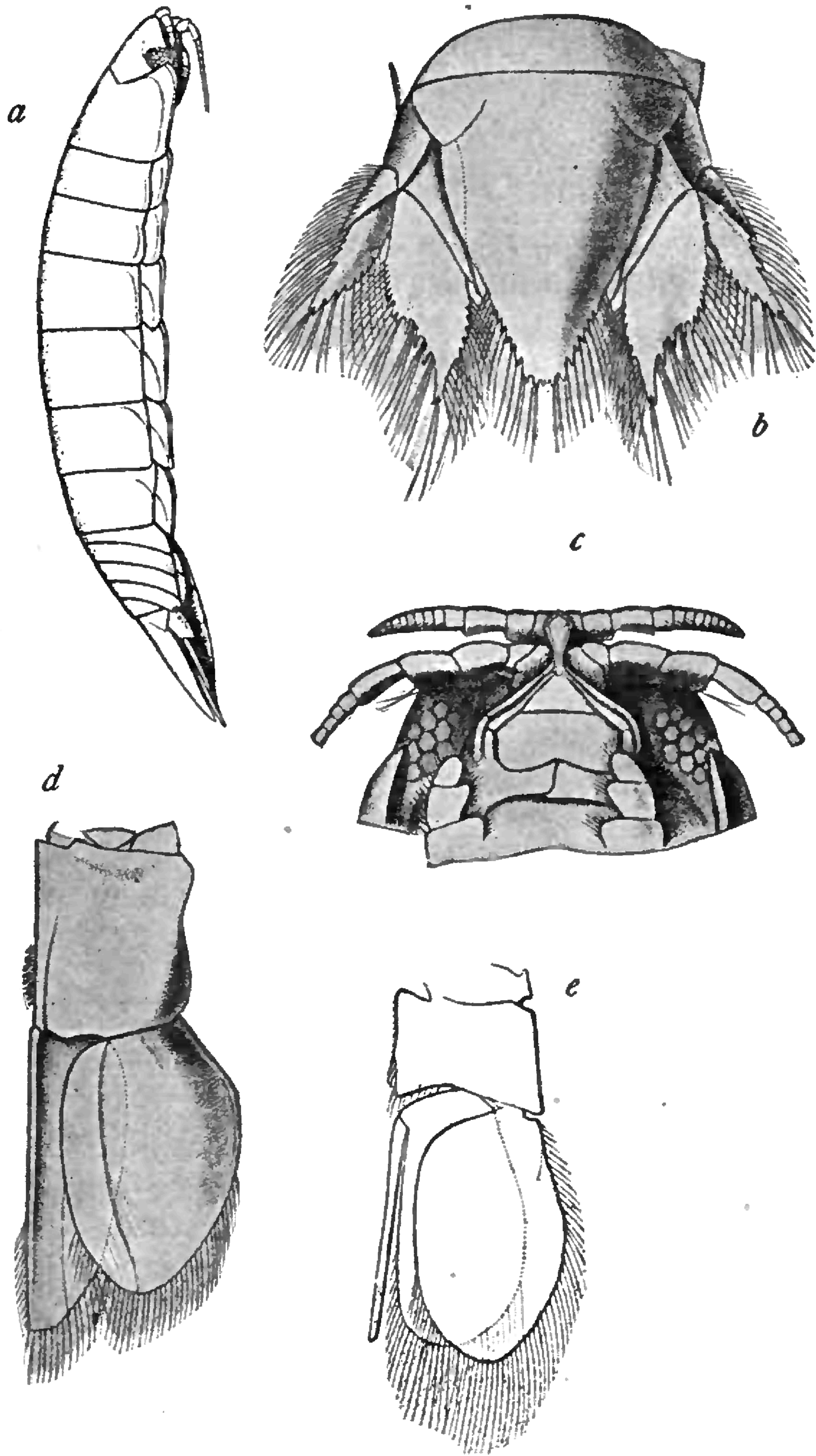


FIG. 100.—CONILERA CYLINDRACEA (AFTER HANSEN). *a*, LATERAL VIEW OF FEMALE. *b*, POSTERIOR PART OF ABDOMEN OF ADULT FEMALE. *c*, ANTERIOR PART OF HEAD. *d*, LEFT PLEOPOD OF FIRST PAIR IN ADULT MALE. *e*, LEFT PLEOPOD OF SECOND PAIR IN ADULT MALE. (ENLARGED.)

The dog-fish is infested with these parasites, which reduce their prey to skin and bones. They hunt, according to Dr. F. Day,^a in shoals, driving away the congers and other fish, but are themselves devoured by the bream.

^aProc. Zool. Soc. Lond., 1884, p. 44.

Body narrow, elongate, a little more than four times longer than broad, 4 mm.: 17 mm., almost cylindrical.

Head wider than long, 2 mm.: 3 mm., with the frontal margin slightly excavate on either side of a small median point. Eyes small, round, composite, and situated in the antero-lateral angles of the head. The first pair of antennæ have the basal article short, but somewhat dilated; the second article is not quite as long as the first; the third is twice as long as the second. The flagellum is composed of ten articles. The first antennæ extend almost 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, the second a little shorter than the first; the third article is equal in length to the first two taken together; the fourth is a little longer than the third; the fifth is a little longer than the fourth. The flagellum is composed of thirteen articles. The second antennæ extend to the middle of the first thoracic segment. The maxilliped is composed of seven articles. The mandible has a

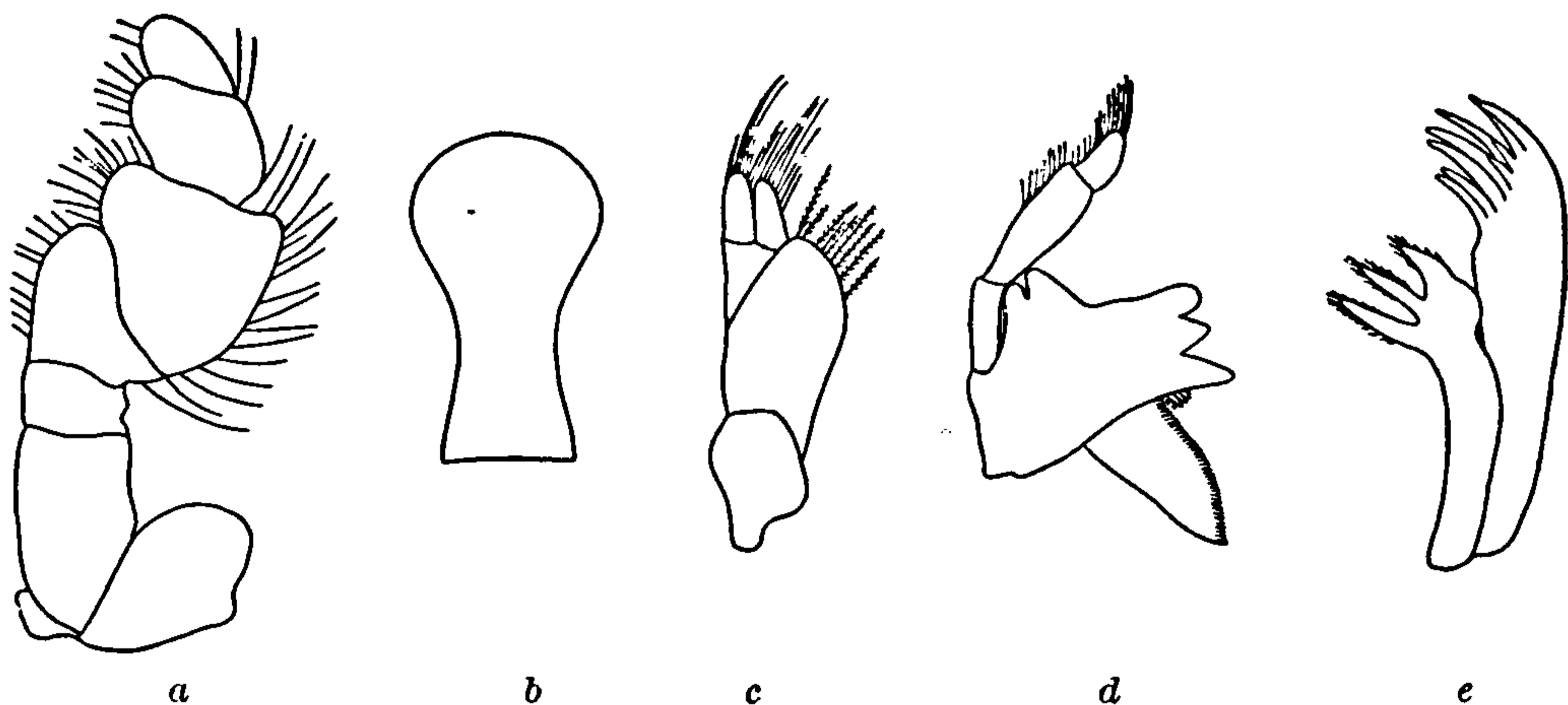


FIG. 101.—*CONILERA CYLINDRACEA*. *a*, MAXILLIPED. $\times 27\frac{1}{2}$. *b*, FRONTAL LAMINA. $\times 51\frac{1}{2}$. *c*, SECOND MAXILLA. $\times 27\frac{1}{2}$. *d*, MANDIBLE. $\times 27\frac{1}{2}$. *e*, FIRST MAXILLA. $\times 27\frac{1}{2}$.

palp of three articles. The frontal lamina is conspicuous on the ventral side; the anterior end is rounded; the posterior end is produced in a narrow process.

The first segment of the thorax is twice as long as the second; the second and third are equal in length; the fourth, fifth, and sixth segments are equal and each is one and a half times longer than the third; the last segment is equal to the third. The epimera are distinct on all the segments, with the exception of the first. They are narrow, elongate plates, equal in width, with the posterior angles not produced beyond the posterior margins of the segments. In the epimera of the first four segments the posterior extremity is rounded; in the last two the outer post-lateral angle is not rounded, but angular. A carina crosses all the segments obliquely.

The first segment of the abdomen is entirely concealed by the seventh thoracic segment except at the sides. The terminal segment is triangular, with the apex very acute. The posterior margin at the apex and

on either side of the apex for some distance is denticulate. The inner branch of the uropoda is a very little longer than the terminal abdominal segment. It is posteriorly very acutely produced with an emargination in the exterior margin near the apex. Both inner and outer margins are denticulate, the four teeth within the emargination being very much larger than the others. There is also a large tooth on the inner margin close to the apex of the branch, giving the extremity a bidentate appearance. The outer branch is half as wide as the inner branch, is somewhat shorter, not extending beyond the emargination in the outer margin of the inner branch, has the extremity acutely produced and bidentate, and has both margins denticulate. The pedun-

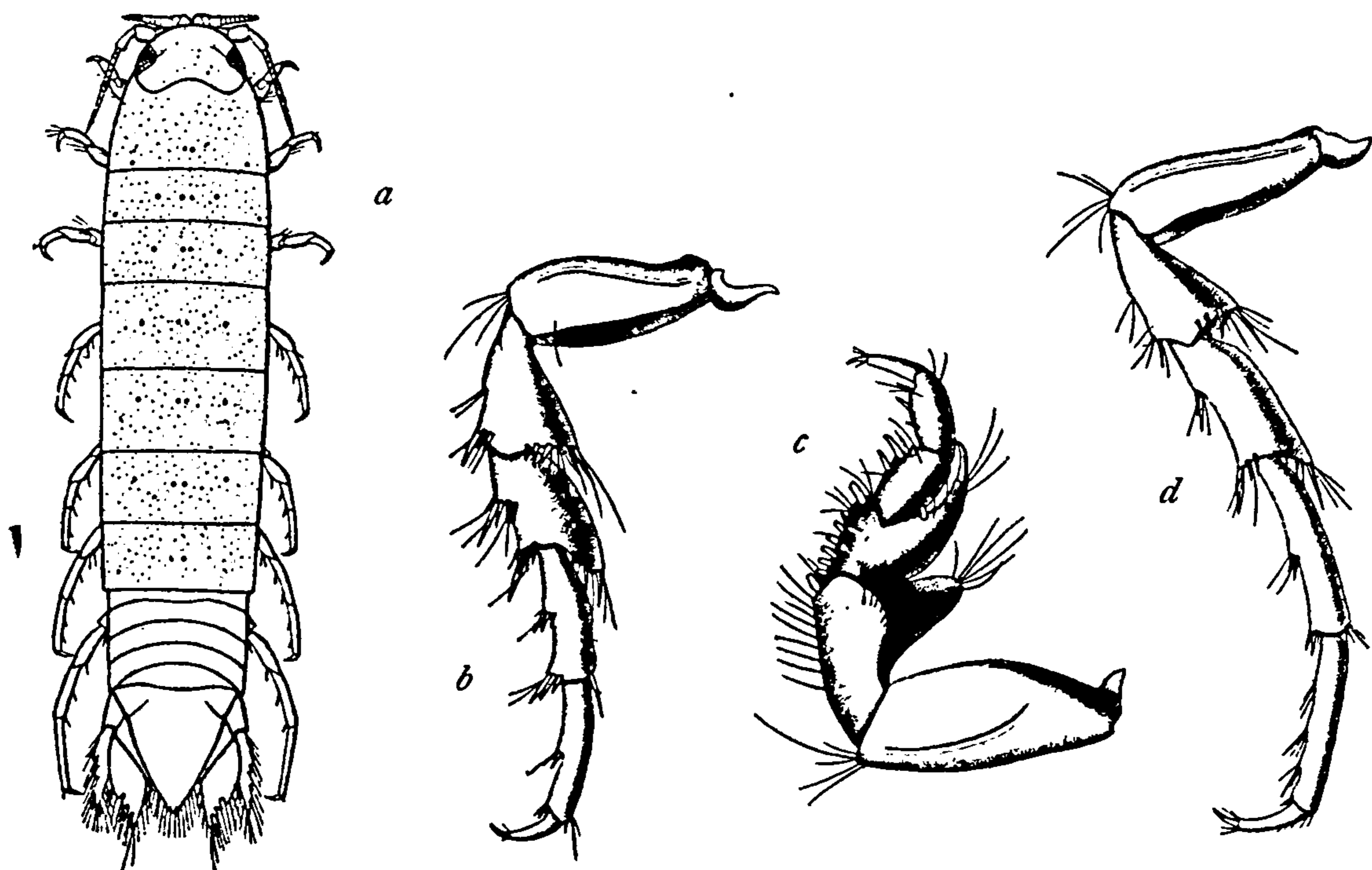


FIG. 102.—*CONILERA CYLINDRACEA* (AFTER HANSEN). *a*, ADULT FEMALE. *b*, SECOND LEG. *c*, FIFTH LEG. *d*, SEVENTH LEG. (ENLARGED.)

cle has the inner angle produced and it extends two-thirds the length of the terminal abdominal segment.

The first three pairs of legs are prehensile, the last four pairs ambulatory. In the first three pairs the propodus is armed with three spines, the carpus with one large spine and one small spine in the first pair or two smaller ones in the second and third pairs; the merus with five or six blunt ones on the inner margin and one long one at the outer distal extremity; the ischium is armed with one spine in the second and third pairs.

The two specimens from North America in the collection of the U. S. National Museum are small, measuring $2\frac{1}{2}$ mm. : $10\frac{1}{2}$ mm.

The description is from a specimen obtained from the Naples Zoological Station.

CONILERA STYGIA Packard.

Conilera stygia PACKARD, Proc. Amer. Assoc. Adv. Sci., XLIX, 1901, p. 228.

Locality.—Monterey, Mexico. Found in wells.

“It is totally eyeless, and adds another to the blind fauna of our caves and wells. Hitherto the genus has been represented by but a single species, inhabiting the British coast. Compared with Bate and Westwood’s figure of *C. cylindracea*, the body is longer, the antennæ much longer, reaching to the middle of the first thoracic segment, those of the second pair nearly to the middle of the seventh thoracic segment. Only the first three pairs of legs are short, with a very thick hand; the four hinder pairs of legs are long, slender. The two last divisions of the pleopoda are unequal, the outer division very narrow, but a little more than half as long as the broad inner division or endopodite. Length of body, 25 mm.; breadth, 5 mm.

“This form is like most, if not all, other blind or eyeless arthropods in having a longer body, antennæ, and legs in compensation for the loss of eyes.”^a—PACKARD.

21. Genus CIROLANIDES Benedict.

Eyes absent. First pair of antennæ with basal article of peduncle not extended straight in front at right angles to remaining part of antenna. Peduncle of the second pair of antennæ composed of five articles.

The plate of the second article of the maxillipeds is furnished with hooks.

Abdomen has all six segments distinct.

The uropoda have the inner angle of the peduncle not produced.

Only the first pair of legs are prehensile; the following six pairs are ambulatory.

CIROLANIDES TEXENSIS Benedict.

Cirolanides texensis BENEDICT, Proc. U. S. Nat. Mus., XVIII, 1896, p. 615.—

RICHARDSON, American Naturalist, XXXIV, 1900, p. 217.—ULRICH, Trans. Am. Microscopical Soc., XXIII, 1902, pp. 88-90, pl. xv.

Locality.—San Marcos, Texas, found in an artesian well.

Body oblong-ovate, about two and a half times longer than wide, 7 mm. : 17 mm.

Head wider than long, 2 mm. : 3 mm. Anterior margin widely rounded. Eyes absent. The first pair of antennæ have the basal article short; the second twice as long as the first; the third one and a half times longer than the second. The flagellum is composed of fifteen articles. The first antennæ extend to the posterior margin

^aProc. Amer. Assoc. Adv. Sci., XLIX, 1901, p. 228.

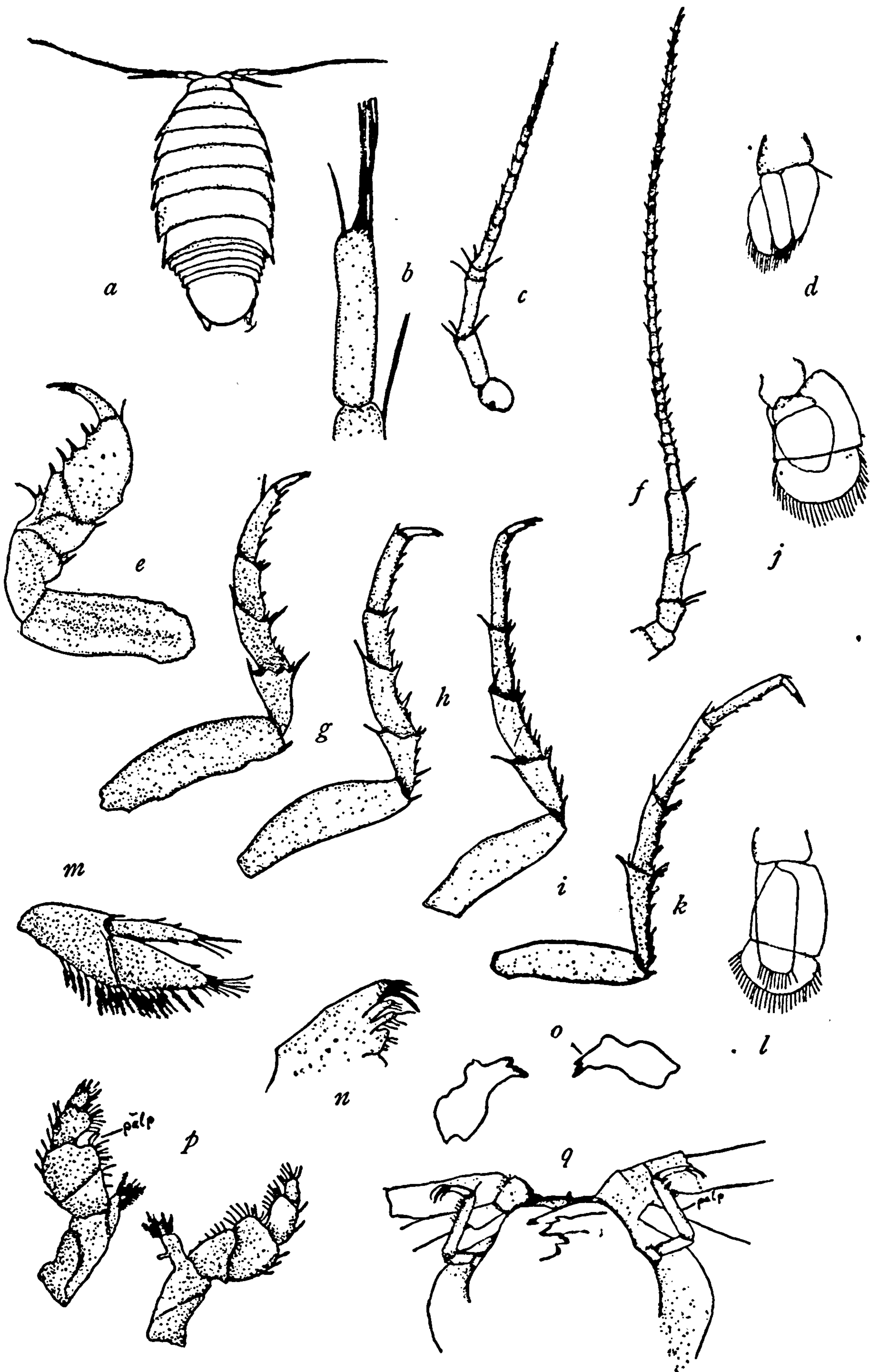


FIG. 103.—CIROLANIDES TEXENSIS (AFTER ULRICH). *a*, DORSAL VIEW. *b*, END OF SECOND ANTENNA. *c*, FIRST ANTENNA. *d*, FIRST PLEOPOD. *e*, FIRST LEG. *f*, SECOND ANTENNA. *g*, SECOND LEG. *h*, THIRD LEG. *i*, FOURTH LEG. *j*, THIRD PLEOPOD. *k*, FIFTH LEG. *l*, SECOND PLEOPOD. *m*, UROPOD. *n*, MAXILLA. *o*, MANDIBLES, *p*, MAXILLIPEDS. *q*, VENTRAL SIDE OF HEAD.

of the first thoracic segment. The second pair of antennæ have the first two articles short, the second one a little longer than the first; the third is as long as the first two taken together; the fourth is nearly one and a half times longer than the third; the fifth is one and

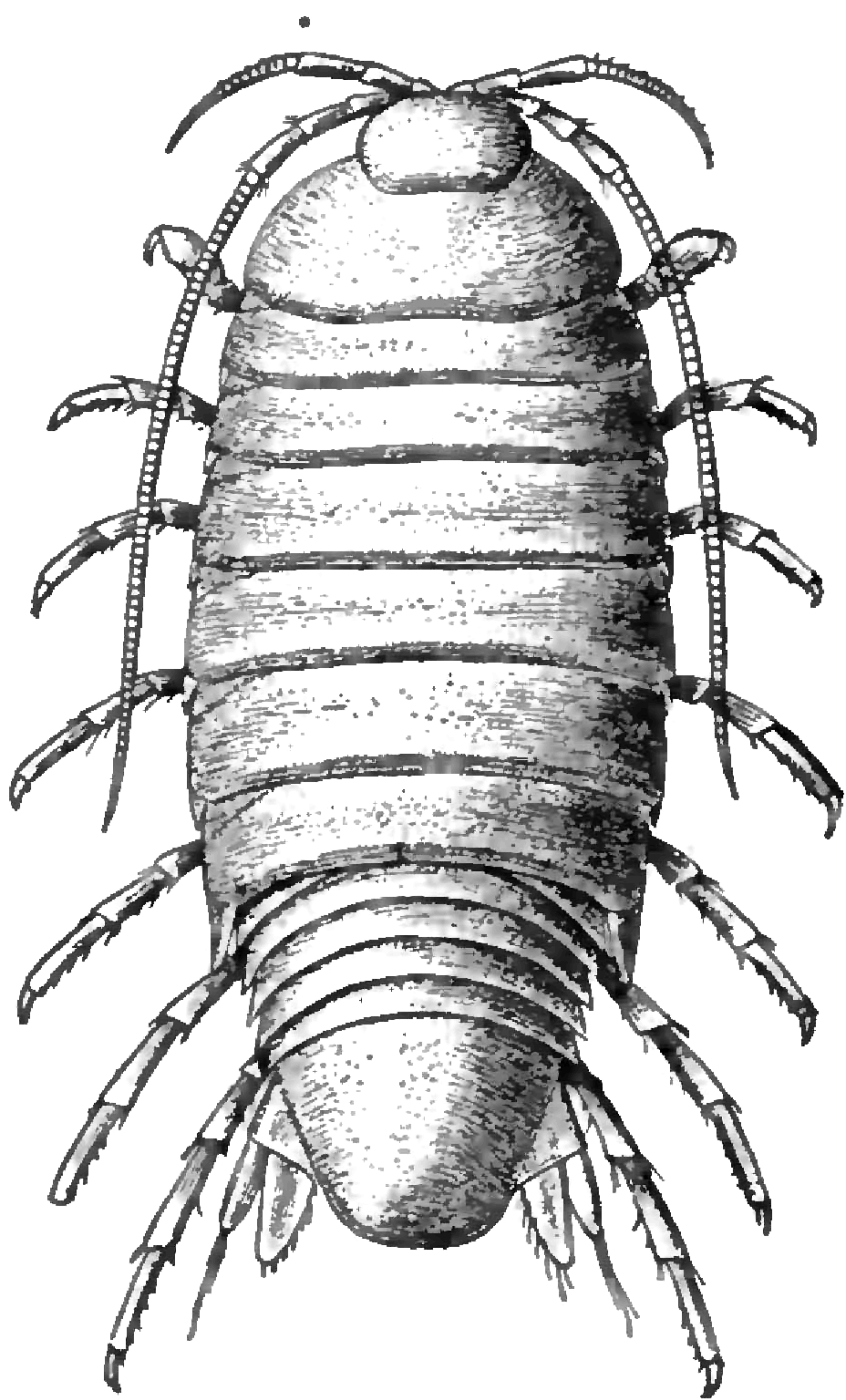


FIG. 104.a—CIROLANIDES TEXENSIS.
× 4½.

a half times longer than the fourth. The flagellum is composed of thirty-six articles. The second antennæ extend to the posterior margin of the fifth thoracic segment. The maxilliped is composed of seven articles. The mandible has a palp of three articles. The frontal lamina is conspicuous on the ventral side, is narrow and compressed laterally, and elevated; it is triangular in shape, with the acute apex of the anterior end extending forward; it is also about twice as long as broad.

The first, fifth, and sixth segments of the thorax are longer than any of the others. The epimera are distinct on all the segments with the exception of the first. They are broad, with the post-lateral angles acutely produced in the last four beyond the posterior margins of the segments. A carina crosses obliquely all the epimera.

The segments of the abdomen are all distinct. The sixth or terminal segment is rounded posteriorly. The uropoda are a little longer

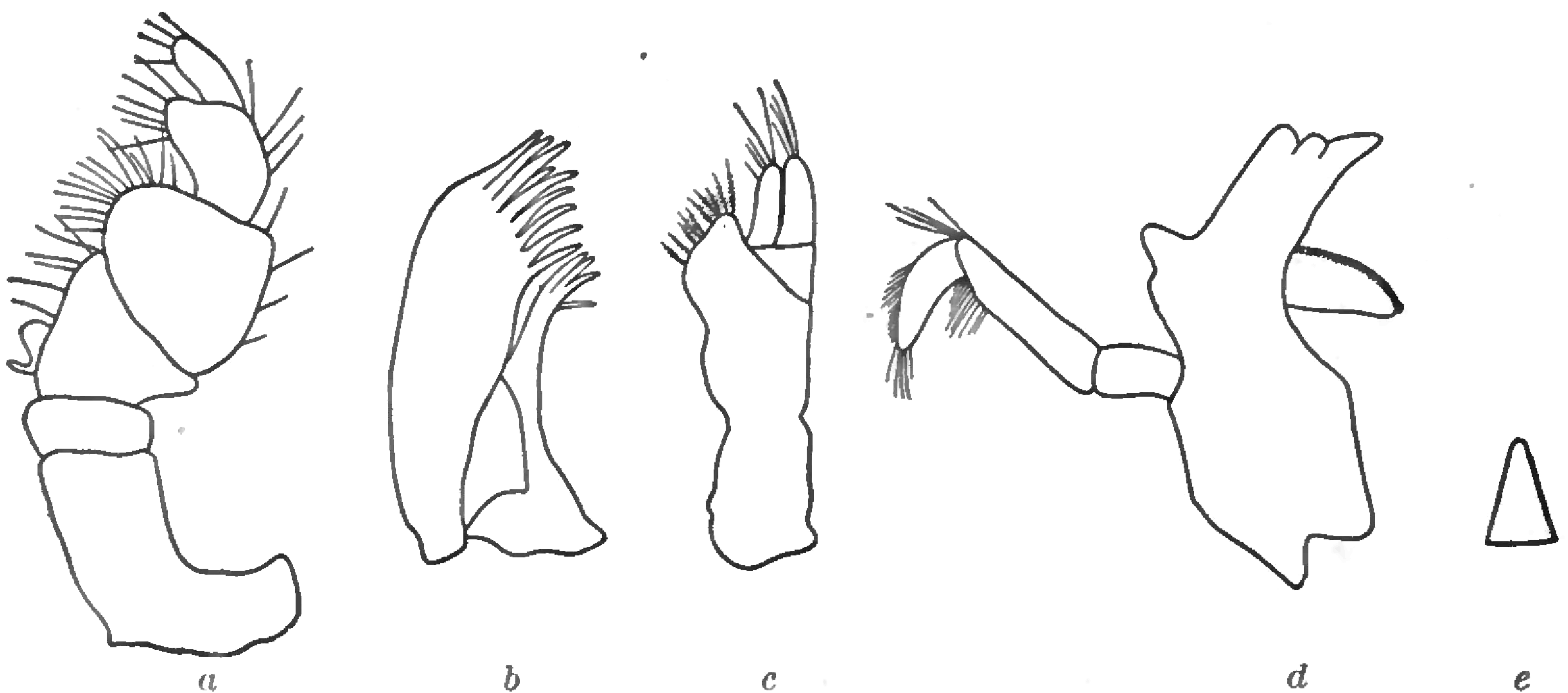


FIG. 105.—CIROLANIDES TEXENSIS. a, MAXILLIPED. × 27½. b, FIRST MAXILLA. × 27½. c, SECOND MAXILLA. × 27½. d, MANDIBLE. × 27½. e, FRONTAL LAMINA. × 51½.

than the terminal abdominal segment. The inner branch is a little longer than the outer branch and somewhat wider. Both are similar in shape, being wider anteriorly than posteriorly, the narrow extremity being truncate. The peduncle is as long as the outer branch, a little more than half the length of the terminal abdominal segment, and is

not produced at its inner angle. Both branches are furnished with spines.

Only the first pair of legs are prehensile. All the others, from the second to the seventh inclusive, are ambulatory. The propodus of the first pair of legs is furnished with three spines; the carpus with one and the merus with one.

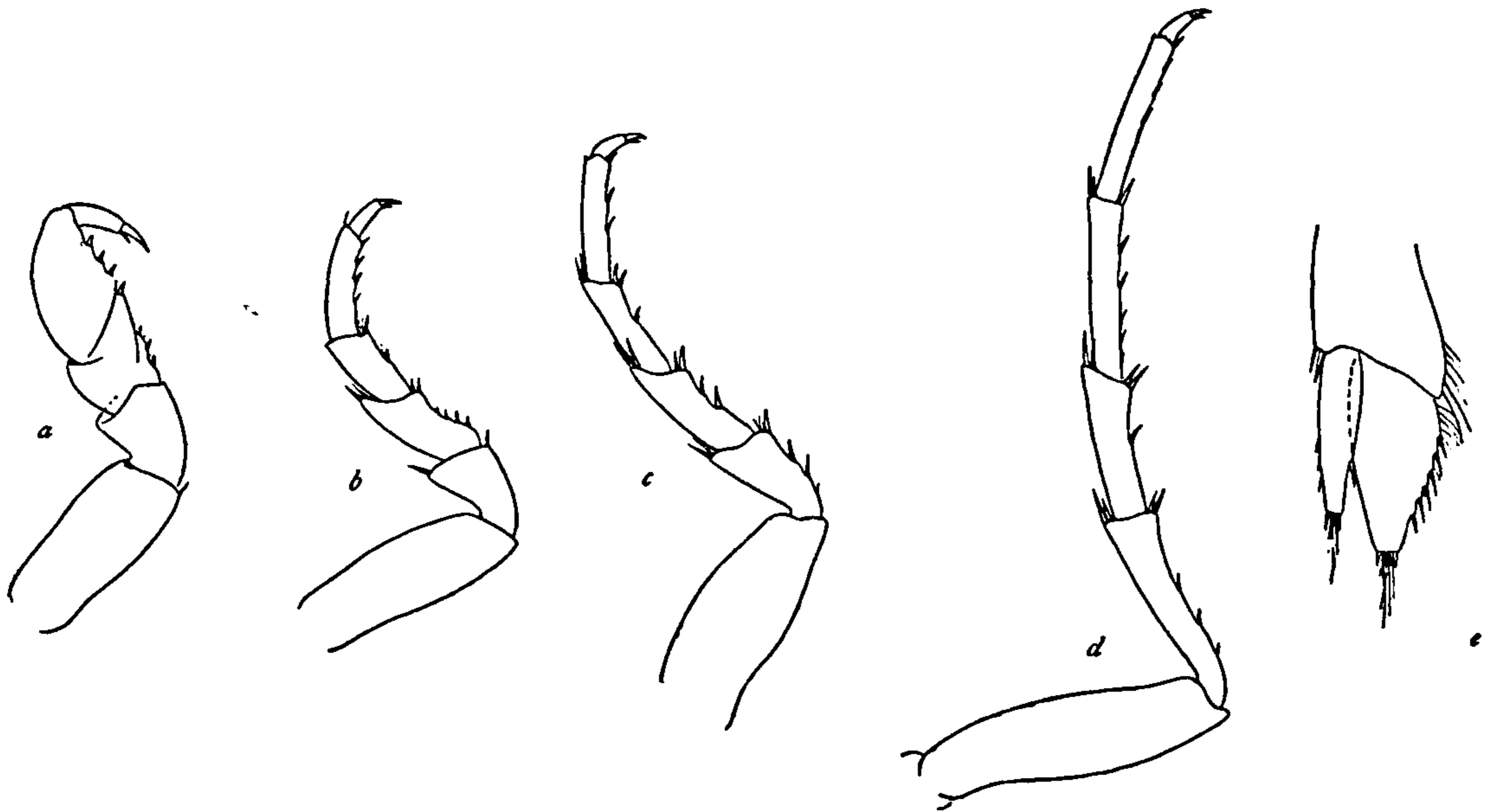


FIG. 106.—CIROLANIDES TEXENSIS. a, FIRST LEG. b, SECOND LEG. c, FOURTH LEG. d, SEVENTH LEG. e, UROPOD.

22. Genus EURYDICE Leach.

The peduncle of the second pair of antennæ is composed of four articles.

The first pair of antennæ have the basal article of the peduncle extended straight in front at right angles to remaining part of antenna.

The plate of the second article of the maxillipeds is not furnished with hooks.

The abdomen has all six segments distinct.

The first and second pairs of pleopods are subequal in structure; the peduncle is very little or scarcely any wider than long; both branches are submembranaceous, the posterior margin being furnished with very long plumose hairs.

The peduncle of the uropoda has the inner posterior angle very little produced.

ANALYTICAL KEY TO THE SPECIES OF THE GENUS EURYDICE.

- a. Terminal abdominal segment rounded posteriorly between the post-lateral triangular teeth. Posterior margin between the lateral teeth denticulate, a spine alternating with each tooth..... *Eurydice convexa* Richardson
- a'. Terminal abdominal segment not rounded posteriorly.
- b. Terminal abdominal segment truncate between the triangular lateral teeth and furnished with four long spines on the posterior margin.
Eurydice caudata Richardson
- b'. Terminal abdominal segment widely emarginate in the middle between the truncate post-lateral angles, each angle being furnished with two robust spines..... *Eurydice spinigera* Hansen

EURYDICE CONVEXA Richardson.

Eurydice convexa RICHARDSON, American Naturalist, XXXIV, 1900, p. 217; Proc. U. S. Nat. Mus., XXIII, 1901, p. 516.

Locality.—Cape San Blas, Florida.

Head transverse; anterior margin rounded. Eyes quadrangular. First pair of antennæ short, reaching the middle of the last peduncular joint of the second pair of antennæ, or the posterior margin of the head; flagellum four-jointed. Second pair of antennæ long, reaching the anterior margin of the terminal abdominal segment in the female; flagellum eighteen-jointed. In the male the second pair of antennæ are equal to the entire length of body, reaching the tip of the terminal segment.

Thoracic segments subequal in length.

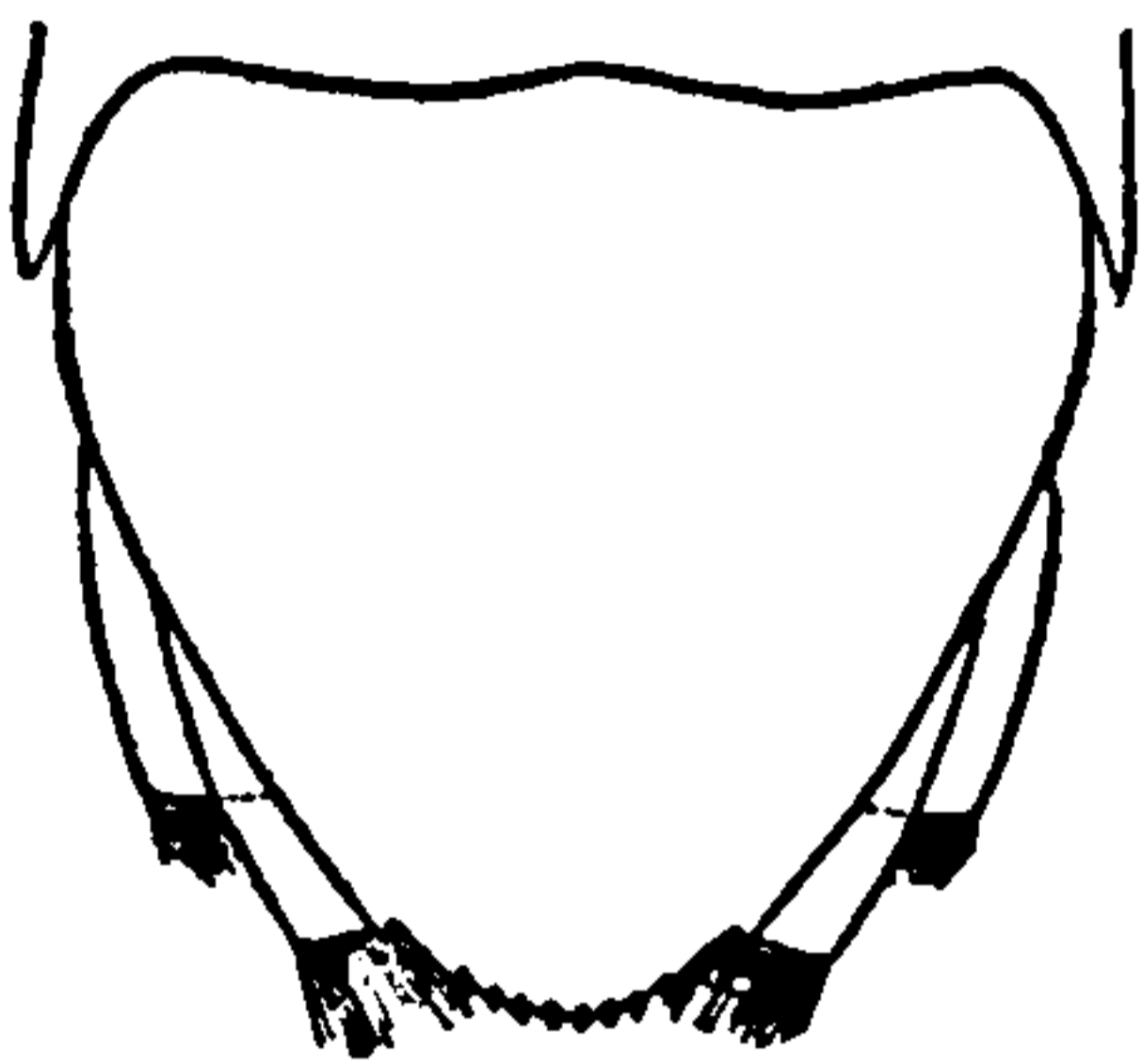


FIG. 107.—EURYDICE CONVEXA. TERMINAL ABDOMINAL SEGMENT.

Abdomen in female shorter than thorax and head together; abdomen in male about equal to thorax and head.

First five segments equal in length. Terminal segment rounded posteriorly, with post-lateral triangular teeth, between which, a space intervening, the posterior margin is denticulate, a spine alternating with each tooth. The uropoda are short, not reaching the extremity of the terminal segment. Both branches are truncate and crenulate on their exterior margins and fringed with long hairs.

Color, light brown, with odd-shaped markings of black.

A number of specimens were taken by the U. S. Bureau of Fisheries steamer *Albatross* at Cape San Blas, Florida.

Type.—Cat. No. 10049, U.S.N.M.

EURYDICE CAUDATA Richardson.

Eurydice caudata RICHARDSON, Proc. U. S. Nat. Mus., XXI, 1899, pp. 824–825; Ann. Mag. Nat. Hist. (7), IV, 1899, pp. 164–165.

Locality.—Isthmus Cove, Catalina Island, California.

Body elongate and narrow. In male, abdomen is equal in length to thorax; in female, it is shorter. Surface of body smooth.

Head widely rounded in front; its anterior margin narrowly thickened. Eyes large and round and situated at a distance of one-third the width of the head apart. First pair of antennæ extend to the posterior margin of the head; flagellum consists of five articles, the first of which is very long and those following quite short. The second pair of antennæ extend as far as the posterior margin of the fourth segment of the abdomen; the flagellum consists of twenty-five long, slender joints. In the female, the second pair of antennæ are much shorter, reaching only to the posterior margin of the last thoracic segment; the flagellum consists of about twenty joints.

The thoracic segments are subequal. The epimera are narrow, and those of the last three or four segments acutely pointed.

All the abdominal segments are visible in a dorsal view. The terminal segment is rounded at the sides and truncate at its extremity, the lateral angles being produced in a short triangular process, between which the posterior margin is distinctly denticulate and bears four spines, which are about twice as long as the lateral teeth. The uropoda are short, not reaching the extremity of the terminal segment, are truncate and crenulate on their posterior margins. The uropoda, as well as the terminal segment, are fringed with short hairs.

The legs are long and slender and armed with many spines.

Color, light brown marked with black spots.

Individuals of this species were collected at Isthmus Cove, Catalina Island, California, by the U. S. Bureau of Fisheries steamer *Albatross*.

Type.—No. 22565, U.S.N.M.

This species resembles *E. grimaldii* Dollfus more closely than any other species of the genus. It differs in the following characters:

1. The greater number of joints in the flagellum of the first pair of antennæ. In our species there are five joints, while in *E. grimaldii* the flagellum is uniarticulate.

2. In the fewer number of joints in the flagellum of the second pair of antennæ. In our species there are only twenty-five, while in *E. grimaldii* the flagellum consists of thirty-two articles.

3. In the presence of four spines on the posterior margin of the terminal segment. In *E. grimaldii* the posterior margin is denticulate.

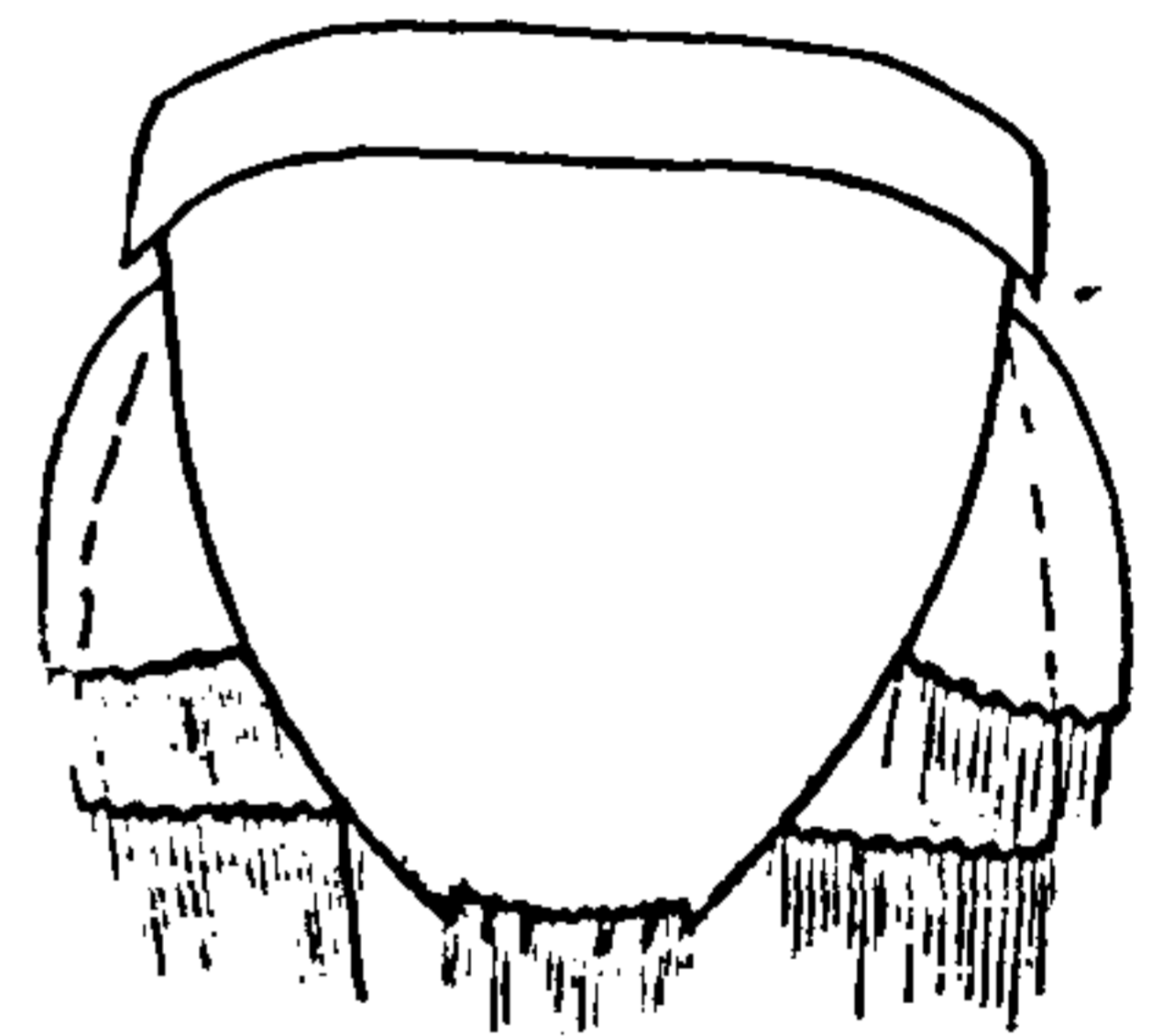


FIG. 108.—EURYDICE CAUDATA. LAST TWO ABDOMINAL SEGMENTS. (GREATLY ENLARGED.)

EURYDICE SPINIGERA Hansen.

Eurydice spinigera HANSEN, Vidensk. Selsk. Skr. (6), V, 1890, pp. 367-369, pl. v, figs. 4-4c; pl. vi, figs. 1-1c.—RICHARDSON, Proc. U. S. Nat. Mus., XXIII, 1901, p. 516.

Locality.—West Indies. ^a

This species is similar to *E. elegantula*. The body is broader than in the male of *E. elegantula* and is a little more than three times longer than wide; the thorax is much wider and not shorter than the abdomen.

The front of the head is a little emarginate, the median process being absent. The eyes are as in the male of *E. elegantula*. The first pair of antennæ are a little stouter than in the female of *E. elegantula*; the first article of the peduncle is narrower, manifestly reaching beyond the second article; the third article is a little wider than long; the flagellum is furnished with rather numerous, rather

^aHansen, in a paper received since this paper was sent to press, says that this species was captured in the eastern part of the Atlantic between Denmark and St. Thomas.

short sensitive hairs, and has the first article two and a half times longer than the three other articles taken together.

The second pair of antennæ extend a little beyond the thorax; the last article of the peduncle is more than twice as long as the penultimate article; the flagellum is composed of about twenty to twenty-four articles, with the exterior articles for the greater part long and without apical hairs. The clypeus occupies all the area between

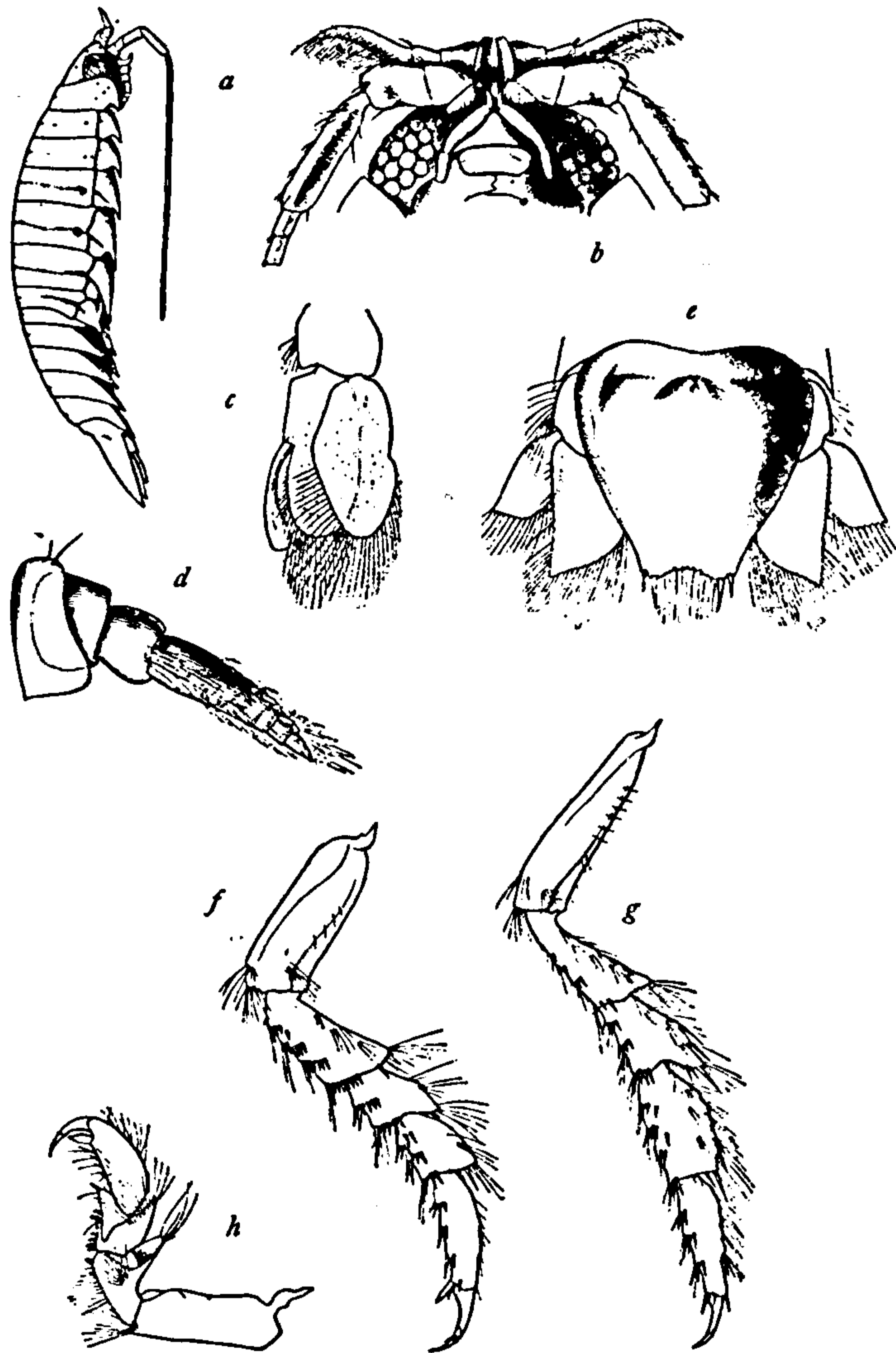


FIG. 109.—EURYDICE SPINIGERA (AFTER HANSEN). *a*, LATERAL VIEW OF ADULT MALE. *b*, ANTERIOR PART OF HEAD (FROM BELOW). *c*, LEFT PLEOPOD OF SECOND PAIR. *d*, FIRST ANTENNA. *e*, POSTERIOR PART OF ABDOMEN. *f*, LEG OF FIFTH PAIR. *g*, LEG OF SEVENTH PAIR. *h*, LEG OF SECOND PAIR. (ENLARGED.)

the mandibular palps and is produced in a long tubercle. The first segments of the thorax are ornamented in the middle transverse line with short and deep furrows; the four posterior segments are ornamented with long transverse furrows.

All the epimera have the posterior angle produced in an acute, conical process, those of the sixth segment being the longest of all, those of the seventh segment being the shortest of all.

The first three pairs of legs are almost as in *E. elegantula*, furnished, however, with more hairs. The last three pairs of legs are a very little shorter and wider than in *E. elegantula*; they are, however, furnished with more hairs. The seventh pair

of legs have the third to the sixth articles furnished on the inferior side toward the inner margin with many short spines, and are ornamented toward the exterior margin with many hairs; the fifth article is a very little shorter than the sixth, and much longer than the fourth; the fourth article is a little longer than wide.

The last segment of the abdomen is furnished at the base with a short and deep median depression and on either side with a deep and rather large lateral excavation; the median depression is bicarinated in the bottom; the posterior margin is a little more than a third part

of the width of the segment, is widely emarginate in the middle, the angles being obliquely truncate, and armed with two robust spines (the inner one much longer than the outer one).

The uropoda extend a little beyond the abdomen; they are large, formed almost as in the male of *E. elegantula*, with the exterior margin of the inner branch, however, a little more curved. The color is brown, covered with scattered black, irregular, and branching spots.

The male appendix does not extend beyond the inner branch, is strongly dilated at the apex, the apex being widely rounded and entire.^a

^aThe above description is adapted from the following one of Hansen's:

Diagn. Corpus paulo plus quam triplo longius quam latius; cauda truncum longitudine subæquans. Clypeus aream totam inter palpos mandibularum occupans, in cornu longum productus. Antennulæ articulo primo flagelli circiter duplo et dimidio longiore quam articulis 3 ceteris cunctis. Antennæ articulo ultimo pedunculi plus duplo longiore quam articulo penultimo. Epimera omnia angulo posteriore in processum conicum, acutum producto. Segmentum ultimum caudæ margine posteriore paulum ultra tertiam partem latitudinis segmenti explente, in medio late emarginato, angulis in obliquum truncatis, spinis binis (interiore multo longiore quam exteriori), robustis, affixis ornatis. Uropoda caudam paulum superantia. Long. maris adulti 9 mm.

E. elegantulæ sat similis. Corpus minus angustatum quam in mare *E. elegantulæ*; truncus sat multo latior et non brevior quam cauda.

Frons ante perpaulum emarginatus, processu medio evanido. Oculi ut in mare *E. elegantulæ*. Antennulæ paulo crassiores quam in femina *E. elegantulæ*; pedunculus articulo primo angustiore, ante articulum secundum manifesto prominente, articulo tertio paulo latiore quam longiore; flagellum setis sensilibus sat numerosis, brevioribus instructum.

Antennæ truncum paulum superantes; flagellum c. 20–24 articulatum; articulis exterioribus ex parte majore longis, seta apicali nulla.

Segmenta anteriora trunci stria transversa brevi, media, profunda ornata; segmenta 4 posteriora saltem stria transversa longa instructa.

Epimera structura in diagnosi commemorata a speciebus omnibus mihi cognitis valde diversa; epimera sexti paris processu conico inter omnes longissimo; epimera septimi paris processu inter omnes brevissimo.

Pedes parium trium anteriorum fere ut in *E. elegantula*, setis tamen pluribus instructi.

Pedes parium trium posteriorem perpaulo breviores et latiores quam in *E. elegantula*; setis tamen pluribus instructi. Pedes septimi paris articulis tertio-sexto in latere inferiore ad marginem interiorem versus spinis multis brevioribus instructi, ad marginem exteriorem versus setis multis ornati; articulus quintus perpaulo brevior quam sextus, multo longior quam quartus; articulus quartus paulo longior quam latior.

Segmentum ultimum caudæ ad basin versus impressione media brevior et profunda et utrinque excavatione laterali profunda et sat magna instructum; impressio media in fundo bicarinata; reliqua in diagnosi commemorata. Uropoda majora, fere ut in mare *E. elegantulæ* formata, margine exteriori rami interioris tamen paulum incurvo.

Color brunneus, maculis irregularibus et ramosis nigris minus crebre conspersis.

Appendix masculina ramum interiorem minus superans, ad apicem versus valde dilatata, apice late rotundato, integro.—HANSEN, Vidensk. Selsk. Skr. (6), V, 1890, pp. 367–369.

23. Genus BRANCHUROPUS Moore.^a

Peduncle of second pair of antennæ composed of four articles. First pair of antennæ with basal article of peduncle extended straight in front at right angles to remaining part of antenna.

Maxillipeds composed of two articles; basal article long; second article short, armed with a few hairs.

Uropods attached to underside of abdomen, similar in structure to the pleopods and probably branchial in function.

Abdomen with all six segments distinct.

BRANCHUROPUS LITTORALIS Moore.

Branchuropus littoralis MOORE, Bull. U. S. Fish Commission, XX, Pt. 2, 1902, p. 168, pl. VIII, figs. 13-21; pl. IX, fig. 1.

Locality.—Porto Rico.

“Body moderately convex, about 2.75 times as long as broad; abdomen not abruptly narrower than the thorax. Head rounded in front, about half as wide as greatest width of body—about two-thirds as long as wide.

“Thorax broadest at fifth joint—fifth and sixth joints longest; the rest shorter and subequal. Epimera of all but first joint distinct; sides of first segment emarginate, the anterior portion being produced somewhat to embrace the eye; epimera of second and third segments not produced posteriorly; of fourth, fifth, sixth, and seventh produced in a sharp process terminated by a spine, that of the last extending beyond the first abdominal segment.

“Abdominal segments all distinct, gradually increasing in length from first to fifth; first segment somewhat narrower, not produced posteriorly at sides, exposed throughout its breadth; the other free segments subequal in breadth, strongly produced posteriorly at sides, the last two armed at each angle with a stout spine.

“Telson rounded, about five-sixths as long as broad, margin not armed, abruptly higher in median two-thirds at base, with an ill-defined, low protuberance or process on each side of middle line.

“Eyes large, black, space between about as great as diameter of eye. Base of first antennæ projecting from beneath overhanging front; peduncle of three joints, the first and second forming a right angle, the second and third joints subequal; flagellum four jointed, the first joint long and tapering, 1.5 times as long as the other three, second and third joints subequal, last joint short and reaching to beyond posterior margin of head.

^aSee Moore for characters of genus, Bull. U. S. Fish. Comm., XX, Pt. 2, 1902, pp. 167-168.

“Second antennæ long and slender, when placed close to sides of body reaching to about anterior margin of telson; peduncle four jointed, joints increasing gradually in length and slenderness, second joint furnished on distal external angle with four or five setæ; flagellum with about eighteen joints, which are longest in its middle.

“Epistome slender, expanded in front and emarginate, reaching to about the level of frontal margin of head, but not connected with it.

“Mandible with tridentate cutting edge, movable pectinate appendage and three-jointed palp, in general resembling this organ in *Eurydice*.

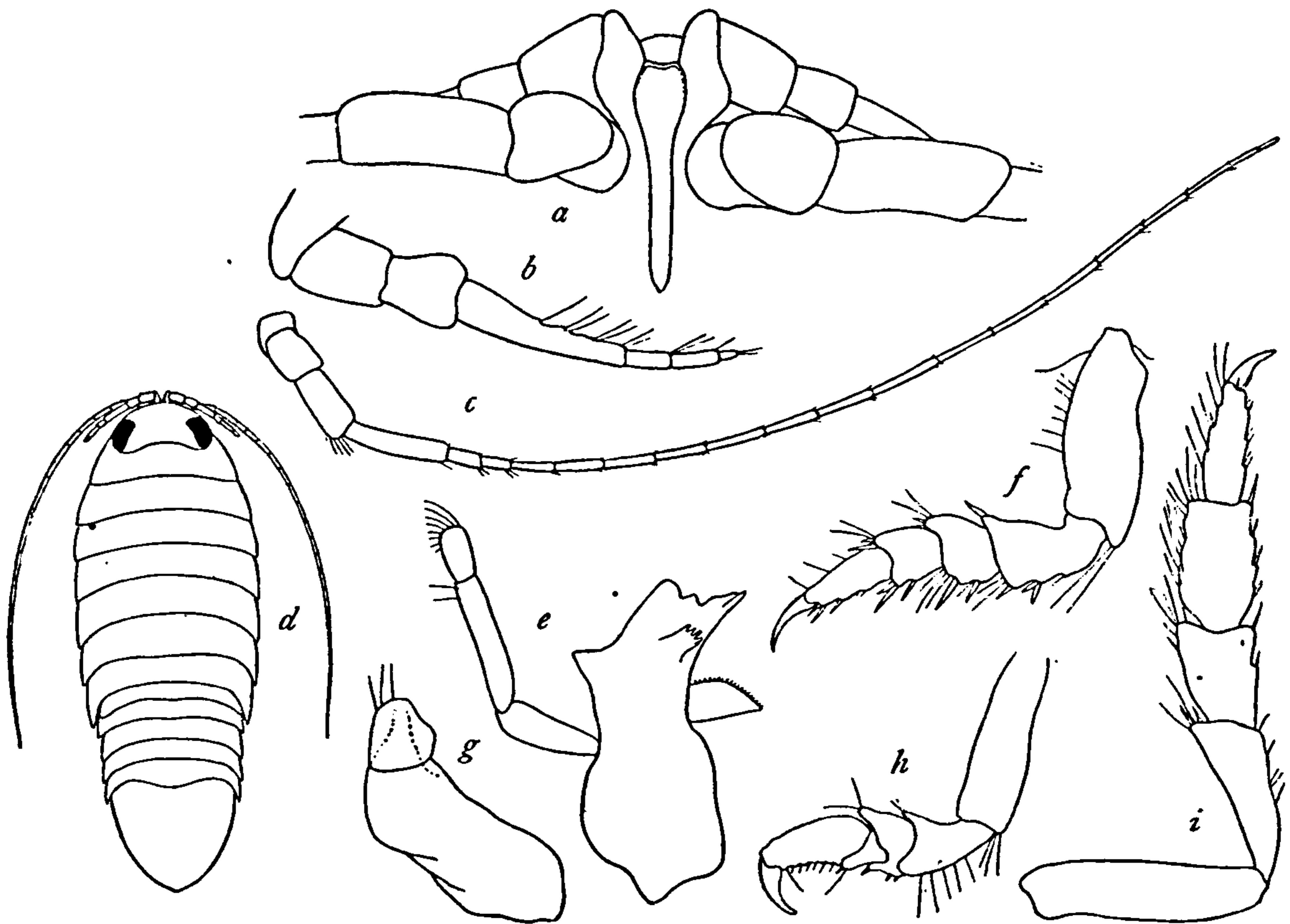


FIG. 110.—BRANCHUROPUS LITTORALIS (AFTER MOORE). *a*, FRONT OF HEAD FROM BELOW. *b*, FIRST ANTENNA. *c*, SECOND ANTENNA. *d*, GENERAL FIGURE. *e*, MANDIBLE. *f*, FOURTH LEG. *g*, MAXILLIPED. *h*, FIRST LEG. *i*, SEVENTH LEG.

“Maxillipeds two jointed, the basal joint long, somewhat transversely of the head; the second joint short and armed with a few hairs distally.

“Thoracic limbs gradually increasing in length posteriorly. First limb with second joint longest, the third, fourth, and fifth successively shorter, the sixth joint as long as third, and pectinate by a series of spines, the last one stoutest, and the seventh not forming with the sixth a subchelate hand, as in *Anuropus*.

“The posterior border of the limb is furnished with spines and setæ. Second and third pairs subsimilar with the fifth joint larger. Fourth to seventh pairs backwardly directed, and becoming successively broader and flatter, resembling the posterior limbs of *Eurydice*,

the fourth pair with numerous stout spines along its internal edge, these becoming fewer and weaker on posterior pairs, which are more abundantly furnished with long slender setæ, the fifth joint of last pair of legs broad and almost rectangular.

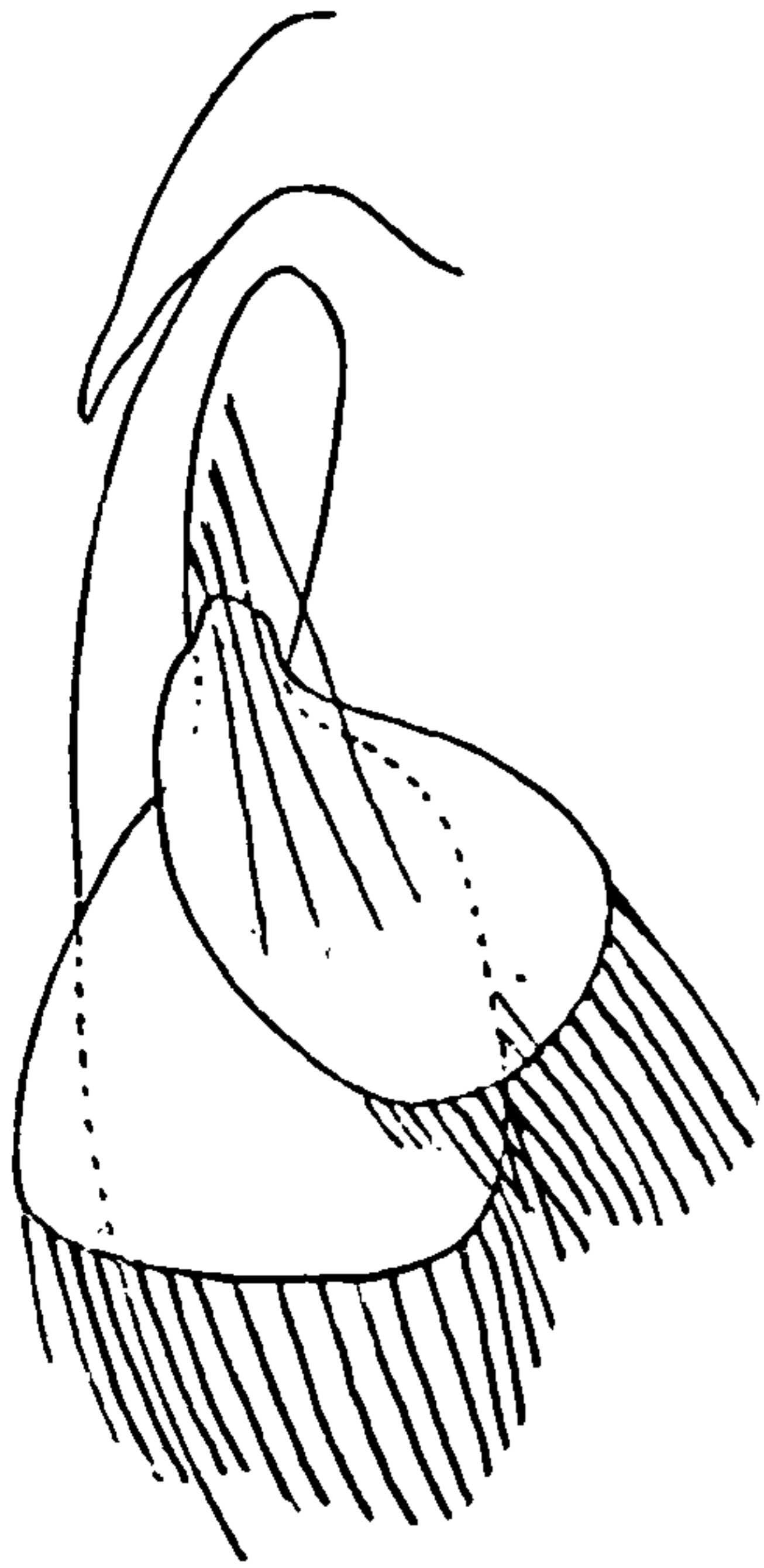


FIG. 111.—BRANCHIOPUS LITTORALIS (AFTER MOORE). UROPODA FROM BELOW.

“Abdominal appendages subsimilar, the uropods not projecting beyond the margin of telson, attached to underside, in structure similar to the pleopods and probably branchial in function.

“Color gray, with arborescent brown pigmentation becoming more dense posteriorly, on abdomen collected principally in a median wedge-shaped mass with the apex on base of telson, each segment of pleon with two subelliptical paler lateral areas, with about twenty-five to thirty longitudinal lines of pigmentation, the areas between which are reticulated with brown. Mandibles, legs, and underside of body more or less pigmented.

“One specimen, from station 6079, 20 fathoms, 6 by 2.2 mm.”—MOORE.^a

24. Genus BATHYNOMUS A. Milne Edwards.

Second pair of antennæ with a peduncle composed of five articles;^b rudimentary scale attached to end of peduncle of first antennæ.

The plate of the second article of the maxillipeds furnished with hooks.

Abdomen with all six segments distinct.

Pleopoda with supplementary ramified branchiæ developed at the base of the inner branches.

BATHYNOMUS GIGANTEUS A. Milne Edwards.

Bathynomus giganteus A. MILNE EDWARDS, Compt. Rend. Acad. Sci., LXXXVIII, 1879, pp. 21-23; Ann. Mag. Nat. Hist. (5), III, 1879, pp. 241-243.—FILHOL, La vie au fond des Mers, 1885, p. 147.—MARSHALL, Die Tiefsee und ihr Leben, 1888, p. 261, fig. 86.—AGASSIZ, Bull. Mus. Comp. Zool., Harvard College, XV, 1888, p. 49, fig. 252.—HANSEN, Vidensk. Selsk. Skr. Math. og Naturvid., Afd. (6), V, No. 3, 1890, pp. 252, 318, 378.—WOOD-MASON and ALCOCK, Ann. Mag. Nat. Hist. (6), VII, 1891, p. 270.—ORTMANN, Proc. Acad. Nat. Sci. Phila., 1894, p. 191.—BOUVIER, Bull. Soc. Entom. France, 1901, pp. 122-123; Compt. Rend. Acad. Sci., CXXXII, 1901, pp. 643-645.—A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zool., Harvard College, XXVII, No. 2, 1902, pp. 141-159, pls. I-VI.—HANSEN, Journ. Linn. Soc. London, Zool., XXIX, 1903, pp. 12-25, pl. IV, figs. 8-9.

^a Bull. U. S. Fish Comm., XX, Pt. 2, 1902, p. 168.

^b See remarks at end of description.

Localities.—West Indies; Gulf of Mexico; Caribbean Sea; Mouth of Exuma Sound; Bay of Bengal.

Depth.—955 fathoms; 740 fathoms.

Body oblong-ovate, nearly two and a half times longer than wide, 38 mm. : 90 mm.

Head wider than long, 12 mm. : 21 mm., with the anterior margin produced in a median point which meets the apex of the triangular frontal lamina. The eyes are large, composite, and are situated on the inferior side of the head. The first pair of antennæ have the basal article large, about as wide as long; the second is about as long as the first; the third is half as long as the second; there is a small scale articulated to the end of the third article of the peduncle; the flagellum is composed of forty-six articles and extends one-fourth the length of the first thoracic segment. The second pair of antennæ have the first article short; the second is almost at right angles to the first and is about 2 mm. long; the third is about as long as the second; the fourth is about 3 mm. in length; the fifth is 4 mm. long. The flagellum is composed of about sixty-six articles and extends to the middle of the fourth thoracic segment. The maxillipeds are composed of seven articles. The frontal lamina is triangular in shape, with the apex contiguous with the median point of the frontal margin of the head.

The first segment of the thorax is the longest, being 10 mm. in length. The second and third are subequal, and each is 6 mm. long. The fourth and fifth are each 5 mm. in length. The sixth and seventh are each 4 mm. long. The epinera are distinctly separated on all the segments with the exception of the first, and are large plates with the outer post-lateral angle produced in the last four beyond the posterior margin of the segments.

The six segments of the abdomen are distinct, the first five being subequal in length. The sixth or terminal segment is wider than

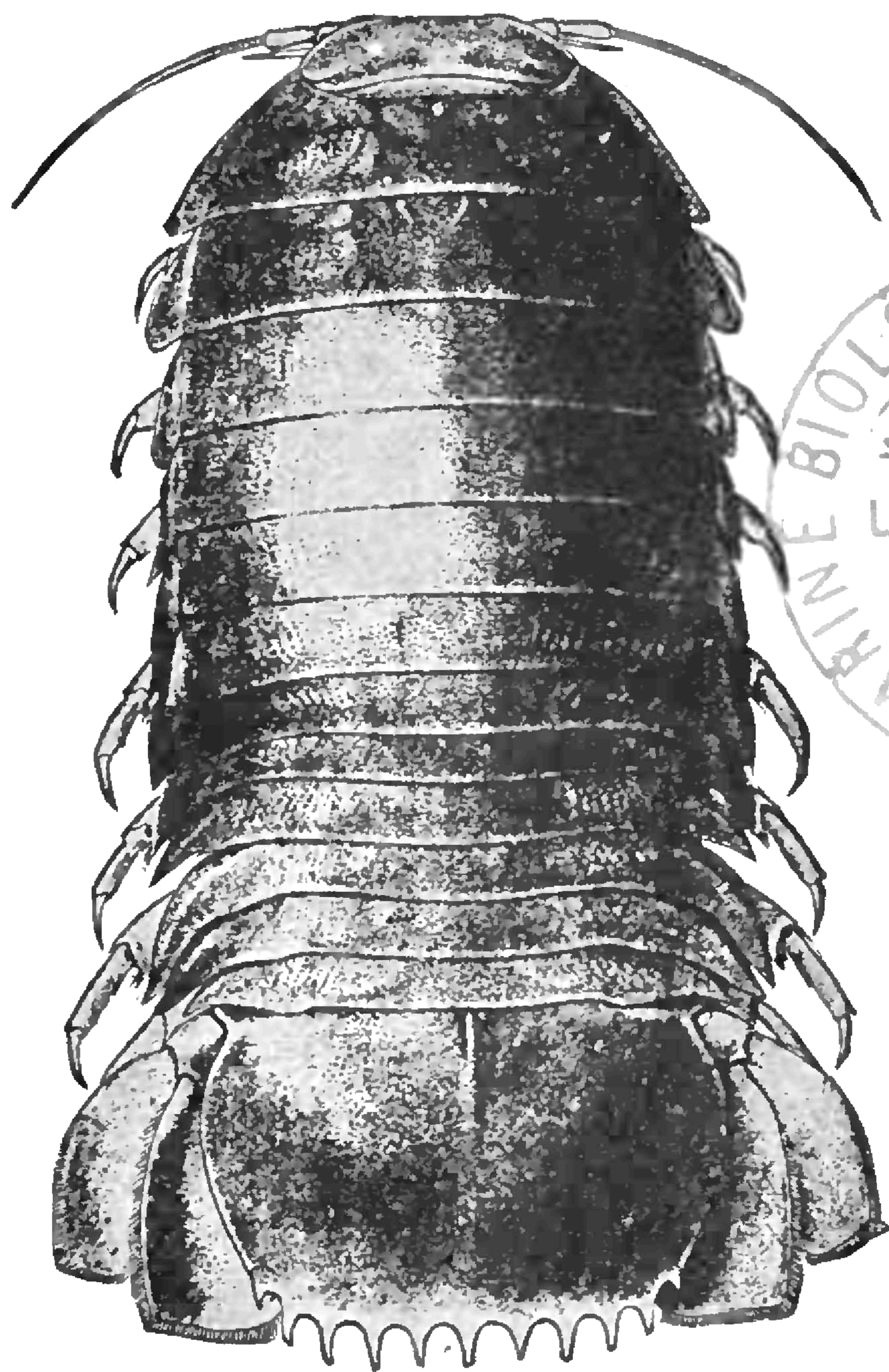


FIG. 112.—*BATHYNOMUS GIGANTEUS* (AFTER EDWARDS AND AGASSIZ). DORSAL VIEW.

long, and has the posterior margin widely rounded and armed with eleven long teeth, five on either side of the median one. This segment is 27 mm. long. The uropods do not quite reach the extremity of the

terminal abdominal segment. The inner branch is nearly twice as wide as the outer branch and is a little longer. Both are truncate posteriorly and have the exterior and posterior margins armed with numerous spines. The peduncle of the uropoda has the inner angle but little produced. The pleopoda have ramified branchiæ developed at the base of the inner branch.

The first three pairs of legs are prehensile, the last four pairs ambulatory. They are all armed with numerous spines.

A larger specimen in the collection of the U. S. National Museum measures $\frac{1}{4}$ in.: $8\frac{1}{2}$ in. It is from the Gulf of Mexico.

Wood-Mason and Alcock^a describe the living animal as being a pale lilac color. Bou-

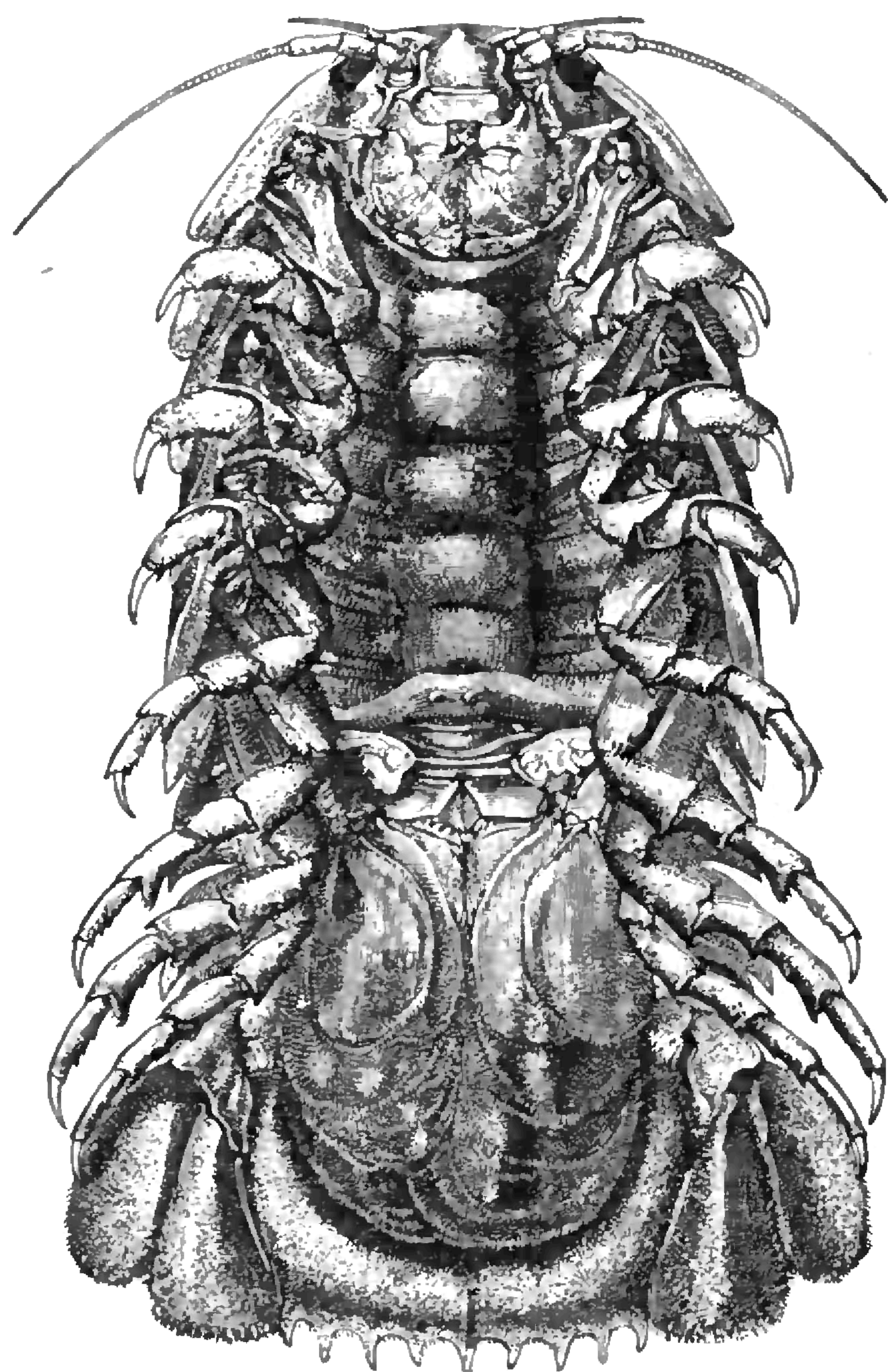


FIG. 113.—BATHYNOMUS GIGANTEUS (AFTER FILHOL).
VENTRAL VIEW.

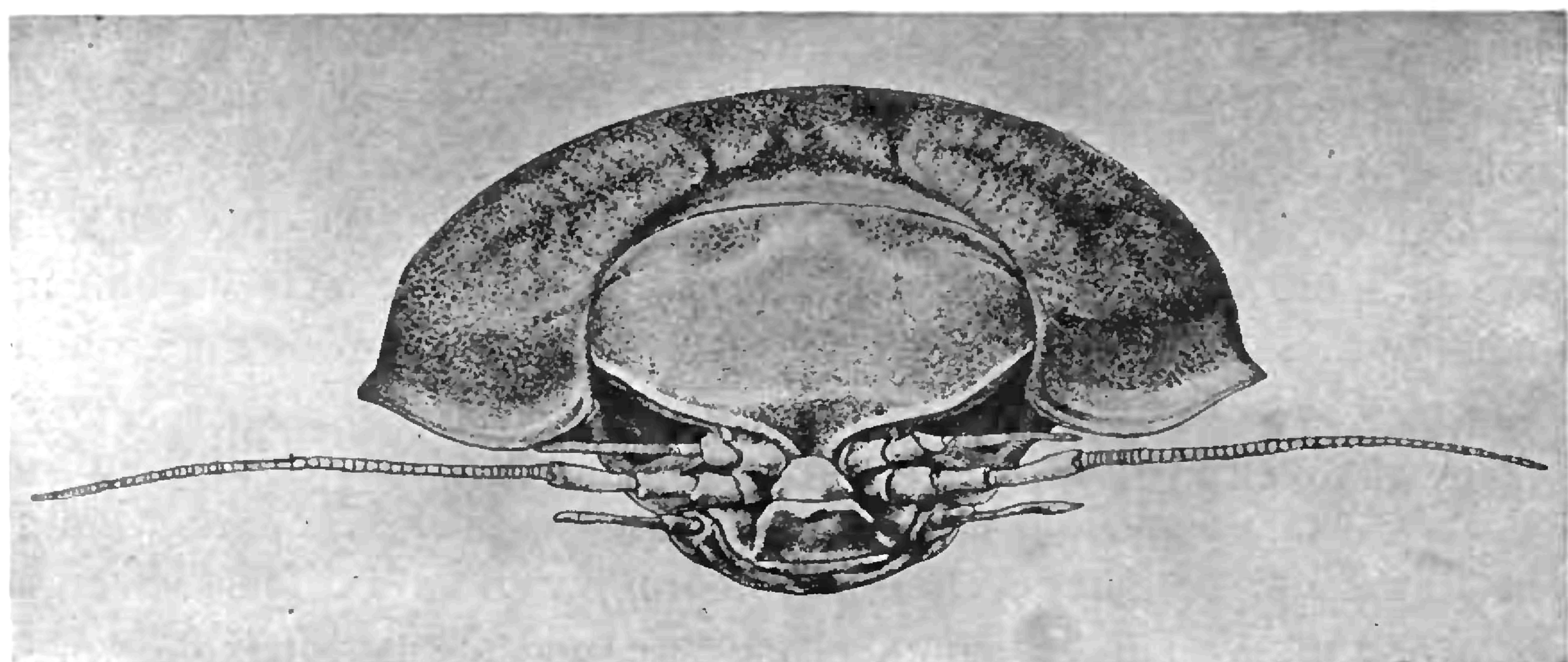


FIG. 114.—BATHYNOMUS GIGANTEUS (AFTER EDWARDS AND BOUVIER). HEAD WITH APPENDAGES AND FIRST THORACIC SEGMENT.

vier says that while the isopods usually have at the most in each eye thirty to forty ocelli, which measure eight to ten centimeters, with a diameter of a millimeter, *B. giganteus* has almost three thou-

^aAnn. Mag. Nat. Hist. (6), VII, 1891, p. 270.

sand, the surface of which is almost doubled. This increase in the measure of the eye is not an effect of the increase in size of the figure, for *B. döderleini* Ortmann has the ocelli almost as large and as numerous as *B. giganteus*; it is entirely the result of adaptation to abyssal life. In order to collect in the greatest number the feeble phosphorescent rays which lighten the depth of the seas, the eyes of *Bathynomus* are greatly enlarged and resemble the eyes of abyssal Galatheides (Munida), in which the deficiency of the light at the great depths has not yet produced blindness.

In the two species of *Bathynomus* he has been able to prove that the sympodite of the pleopods has always three articles, that it is the same for the peduncle of the antennulæ, and that a rudiment of an accessory appendage exists at the apex of this peduncle. The presence of this accessory appendage is a primitive character which brings

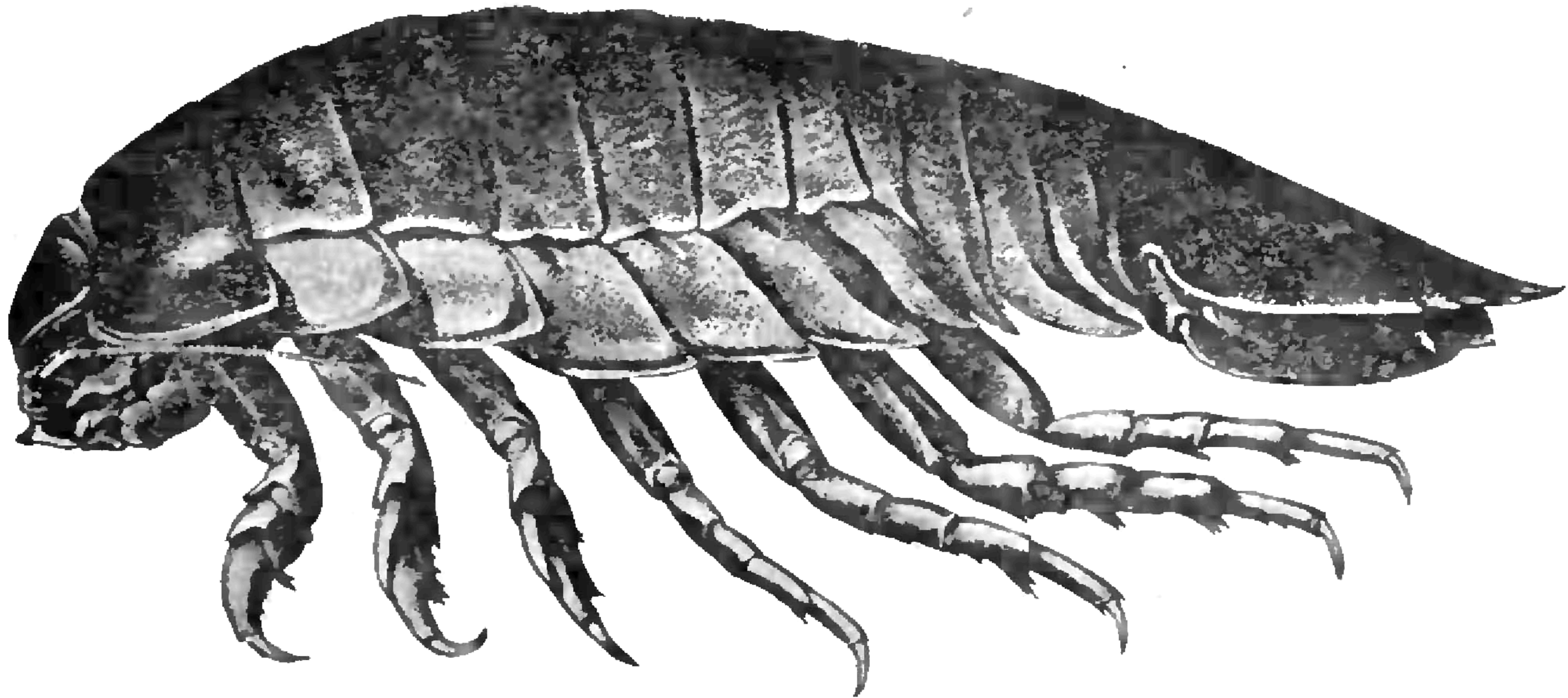


FIG. 115.—BATHYNOMUS GIGANTEUS (AFTER EDWARDS AND BOUVIER). LATERAL VIEW.

the *Bathynomus*, and consequently the Cirolanidæ, closer to the group of Anisopods.

Hansen points out that the peduncle of the second pair of antennæ is really composed of six articles in this form and others, but the first article is so small it has heretofore been overlooked.^a Apparently the peduncle of the second antennæ is composed of five articles.

25. Genus COLOPISTHUS Richardson.

Head transversely elongated. Eyes situated in the middle of the lateral margins at the extreme edge and elevated knob-like above the surface.

Both pairs of antennæ short; first pair of antennæ with basal article of peduncle not extended straight in front at right angles to remaining part of antenna; second pair reach the posterior margin of the first thoracic segment.

First five abdominal segments consolidated into one short segment. Terminal segment strongly keeled in the median longitudinal line.

^aEdwards and Bouvier describe the peduncle as six-jointed, but, according to Hansen, they were in error in regard to the position of the first joint.