

NO. 4. — *Reports on the Results of Dredging, under the Supervision of ALEXANDER AGASSIZ, on the East Coast of the United States, during the Summer of 1880, by the U. S. Coast Survey Steamer "Blake," COMMANDER J. R. BARTLETT, U. S. N., Commanding.*

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### XXIII.

*Report on the Isopoda.* By OSCAR HARGER.

THE collection of Isopoda from the Blake Expedition, although small in number, is remarkable for the large proportion of interesting forms secured, since nearly all the specimens prove to belong to species that are either new, or not hitherto known from our coast, or to species known only from single specimens and hence only imperfectly described.

#### CIROLANIDÆ.

*Cirolana spinipes* BATE & WESTWOOD.

Plate I. Figs. 2-2d. Plate II. Figs. 1-1c.

*Cirolana spinipes* BATE & WESTWOOD, Brit. Sess. Crust., II., p. 299. 1868.

Specimens of this species, not hitherto recorded from our coast, were obtained from two localities; viz. Station 316, Lat.  $32^{\circ} 7' N.$ , Long.  $78^{\circ} 37' 30'' W.$ , 229 fathoms, one female; and Station 321, Lat.  $32^{\circ} 43' 25'' N.$ , Long.  $77^{\circ} 20' 30'' W.$ , 233 fathoms, three females and one male.

These specimens appear to agree perfectly in all specific characters with others in the collection of the Yale College Museum identified and sent to the Museum by the Rev. A. M. Norman, from the Shetland Islands. They do, however, differ in some respects from the description of that species in Bate and Westwood's work, and to facilitate comparison with that species and with others on our coast a full description is appended, with figures.

The body is a little more than three times as long as broad, with the dorsal surface strongly rounded, polished and smooth except for minute punctations, mostly near the posterior margin of each segment, and a median dorsal row of shallow oval depressions, most distinct on the third, fourth, and fifth thoracic segments.



The head is quadrate, widest across the posterior part of the eyes, which are oval, and more distinct than in the other species on our coast. A horizontal impressed line passes along the side of the head above and in front of the eye, and another just above the anterior margin over the bases of the antennæ. The antennulæ (Pl. I. Fig. 2 a) are short, not equalling the peduncle of the antennæ. Their basal segments are in contact above and in front; the second segment is short, the third as long as the first two, and is followed by a flagellum not as long as the peduncle and composed of about fourteen short and closely united segments. The antennæ (Pl. I. Fig. 2 b), when reflexed, reach the posterior margin of the third thoracic segment; the first two peduncular segments are short; the third and fourth each twice as long as the second, and of somewhat greater diameter; the fifth is the longest peduncular segment, and, at base, only about half the diameter of the fourth. The slender, tapering flagellum is about twice as long as the peduncle, and composed of twenty-five or more segments. The fourth and fifth peduncular segments bear, near their distal ends, a few slender and rather short bristles, much less conspicuous than in *C. concharum* or *C. polita* (Pl. I. Fig. 1 b), but longer than in the next species, *C. impressa* (Pl. I. Fig. 3 b).

The first thoracic segment is slightly longer than the second; posteriorly the segments increase slightly in length to the fifth or sixth, but the seventh is the shortest. The first segment is marked by an impressed curved line just above the lateral margin. The epimera of the second and third segments are small, subquadrate, rounded behind. The fourth epimeron is larger than the preceding ones, with the lower posterior angle rounded. The fifth and sixth epimera are of about equal size and larger than the others, while the seventh is the smallest of all. In the last three the posterior margin is oblique, and the lower angle is pointed. All the epimera are quadrate in general outline, and from near the middle of the line of union with the segment a sharp depressed line extends upward upon each of the last four segments.

In the first pair of legs (Pl. II. Fig. 1 a) the basis is flattened on the upper or inner side, and slightly curved in adaptation to the convex under surface of the head. The anterior margin of this segment is also fringed with bristly hairs. The succeeding segments are well armed with bristles, and the merus, carpus, and dactylus are armed along their palmar margins also with acute spines; the carpus in this leg is triangular and articulated with little motion to the propodus. The legs of the second and third pairs resemble the first, but have a free articulation between the propodus and carpus, which is oval and armed with several acute spines. These three pairs of legs are directed forward. The fourth and subsequent pairs are directed backward. The legs of the fourth pair (Pl. II. Fig. 1 b) are of moderate length and well armed with bristles or spines throughout, especially on the merus and carpus, where the spines form a striking feature. The palmar margin of both these segments is armed with a row of slender elongated spines and bristles, with many shorter spines also along the margin, while upon the outer or exposed surface of both segments is a pretty regular longitudinal row of short spines, nearly along the middle of



the segment, and others in less regular order between this row of spines and the palmar border. In the English specimens these spines are even somewhat more numerous than in ours. The fifth leg is similar to the fourth, but somewhat longer and more slender, and the spines on the merus and carpus are nearly as pronounced and definitely arranged as in the fourth, while a similar arrangement is found in a less degree upon the remaining two pairs of legs. In the last two pairs of legs the bases are flattened, expanded, and well ciliated, forming strong swimming organs. One of the last pair is figured on Plate II. Fig. 1 c.

All of the pleonal segments are plainly evident above, the first not being at all concealed by the last thoracic segment, as in the other species on our coast. The first four segments are subequal in length on the median dorsal line; laterally they are carinated, the carina ending behind in an angulation (see Pl. I. Fig. 2 c) which is most pronounced on the third segment and is rounded off on the fourth. The thickened, chitinous walls of these segments are more or less continued below the lateral keel upon the inferior surface of the pleon, and in the first two segments the inner and posterior angles of this portion are acutely produced, in the second segment, into short, divergent spiniform processes. In the third, the under part of the segment runs out to its lateral angle, and in the fourth segment this portion is small and not angulated. All these segments are smooth and not ciliated laterally. The fifth segment is small, and does not reach the lateral margin of the pleon. The last segment (Pl. II. Fig. 1) is semioval, acutish at the tip, near which it is ciliated and bears a few short spines. The basal segment of the uropod is produced at the inner angle to about half the length of the outer ramus. This ramus is lanceolate in outline, shorter than the inner, and of only about half its width; both are ciliated and armed with short spinules. The inner is destitute of the emargination seen on the outer border near the tip in the other species. The second pair of pleopods in the male (Pl. I. Fig. 2 d) is armed, on its inner ramus, with a stylet of peculiar form. The stylet is slightly longer than the ramus and very acute at the tip, just below which it is suddenly much expanded and sends off a prong on the outer side, toward the lamella, as shown in the figure. A similar structure is seen in the male from the Shetland Islands, but I have seen nothing like it in the other American species.

Length of female, 23 mm.; breadth, 7.5 mm. The single male specimen obtained is smaller: length, 16 mm.; breadth, 5.5 mm.

### ***Cirolana impressa* sp. nov.**

**Plate I. Figs. 3-3d. Plate II. Figs. 3-3c.**

This species closely resembles *C. polita* (Stimp.), as may be seen from the figures of the two species (Pl. I. Fig. 1, *C. polita*, Fig. 3, *C. impressa*). They are most readily distinguished by the impressed lines on the surface of the epimera in the present species, but a closer inspection brings to light other characters, as will appear in the following description.



The body is more than three times as long as broad, with the sides nearly straight and parallel, smooth and polished, with fewer punctations than in *C. polita*, but with the usual median dorsal row.

Head rounded hexagonal, broadest across the eyes, with an impressed line just above them extending around the front of the head. Eyes small, subtriangular, notched on their front outline by a thickened marginal ridge, which dies out in the ocular region. Antennulæ (Pl. I. Fig. 3 a) about as long as the peduncle of the antennæ; two basal segments swollen and together longer than the third; flagellum as long as the peduncle, composed of about a dozen segments, shorter and more closely articulated than in *C. polita*. (Pl. I. Fig. 3 b). Antennæ surpassing the margin of the first segment, shorter than in the preceding species; flagellum one half longer than the peduncle and composed of about twenty-two segments.

First thoracic segment closely adapted to the hinder margin of the head, about twice as long on the median line as the second. Behind the second, the segments gradually increase in length to the seventh, while in *C. polita* the fifth is the longest segment and the seventh is shorter than the sixth. The first segment is marked in the epimeral region by a nearly marginal impressed line. In the following segments the epimera are distinct and increase in size to the last. The second and third epimera are subquadrate, with rounded posterior angles, much as in *C. polita*, but each is marked by a curved impressed line below and somewhat behind the middle. The third and fourth epimera are also quadrate in outline, the posterior margins becoming oblique and meeting the inferior margin in each at an angle, while in *C. polita* both these epimera are rounded behind. In the present species, moreover, both these epimera are marked with an oblique impressed line running from near the middle of the upper margin toward the lower posterior angle. The last two epimera are subtriangular in outline, as in *C. polita*, and the sixth is marked with an impressed line, much as in the fourth and fifth. A similar line is faint, or represented by a row of punctations, on the last epimeron. The impressed lines on the epimera of this species serve also to distinguish it from *C. concharum* (Stimp.), to which it has considerable resemblance.

In the first pair of legs (Pl. II. Fig. 3 a) the merus is large and produced at its outer angle beyond the middle of the propodus, its palmar margin is armed with acute spinules much as in *C. polita*, but not quite as strong as in that species (Pl. II. Fig. 2 a), while it differs from *C. concharum* (Pl. II. Fig. 4 a) in lacking the row of blunt spinules near the palmar margin of this segment. The legs of the fourth pair (Pl. II. Fig. 3 b) are armed with spines, with comparatively few bristles among them, and the spines upon the surface of the merus and carpus are arranged transversely, instead of as in the last species. In the seventh pair of legs (Pl. II. Fig. 3 c) the basis is slender and nearly naked, as in *C. concharum* (Pl. II. Fig. 4 c), and the three following segments are flattened and furnished with close-set bristles distally.

The pleon (Pl. I. Fig. 3 c) is more overlapped and concealed by the last thoracic segment than in either *C. concharum* (Pl. I. Fig. 4) or *C. polita* (Pl. I.



Fig. 1 c). The first segment is quite concealed above, and the second more or less concealed also in the ordinary position of the segments. In the ventral portions of the first three pleonal segments the posterior angles are rounded instead of being acute, as in both the *C. polita* and *C. concharum*; laterally the second, third, and fourth segments are ciliated, as in both those species. The telson (Pl. II. Fig. 3) is much like that of *C. polita* (Pl. II. Fig. 2). The uropods have the basal segment produced internally; the outer ramus is about half as wide as the inner, which has a distinct notch near the distal end of the outer border and is obliquely truncate, or, in the larger specimens, emarginate at the end; both rami, like the end of the telson, are strongly ciliated, but sparingly spinulose. The telson is distinguished from that of *C. concharum* (Pl. II. Fig. 4) by the emargination at the tip in that species. The stylet on the second pair of pleopods in the male (Pl. I. Fig. 3) is simple, ensiform, and tapers to a blunt point; it surpasses the lamella to which it is attached.

The four large females of this species obtained by the Blake Expedition measure in length 21–23 mm. and in breadth 6–6.5 mm. Specimens obtained by the U. S. Fish Commission are many of them smaller, but vary from 15 to 27 mm. in length.

The specimens were obtained at Station 336, Lat. 38° 21' 50" N., Long. 73° 32' W., from a depth of 197 fathoms. Others have also been obtained by the U. S. Fish Commission at the following stations:—

Station.	Fathoms.	N. Lat.	W. Long.	Specimens.
871	115	40° 2' 24"	70° 23' 40"	4
949	100	40° 3'	70° 31'	11
1094	301	39° 57'	69° 47'	1
1095	321	39° 55' 28"	69° 47'	2

### ÆGIDÆ.

#### *Æga psora* (LINNÉ) KRÖYER.

One specimen from 306 fathoms at Station 303 in Lat. 41° 34' 30" N., Long. 65° 54' 30" W.

#### ? *Æga Webbii* (GUÉRIN) SCHIÖDTE & MEINERT.

*Pterelas Webbii* GUÉRIN, Mag. Zoöl., Classe VII., Pl. XX. 1836.

*Æga Webbii* SCHIÖDTE & MEINERT, Naturhist. Tidssk., R. III., B. XII., p. 347. Pl. X. (Cym. IV.) Figs. 1–4. 1879.

A single immature specimen of this, or a closely allied species, was taken at Station 307, Lat. 31° 57' N., Long. 78° 18' 35" W.; from a depth of 333 fathoms. It measures 10.5 mm. in length, 5.5 mm. in breadth, and has not yet developed the seventh pair of legs, but the propodi of the second and third pair of legs are armed with the characteristic cultriform spine, and I have referred it to this species, though not with certainty.



*Æga incisa* SCHIÖDTE & MEINERT.

## Plate III. Fig. 1.

*Æga incisa* SCHIÖDTE & MEINERT, Naturhist. Tidssk., R. III., B. XII., p. 373, Pl. X. (Cym. IV.) Figs. 13-15. 1879.

A single specimen, apparently of this species, was taken at Station 307, from a depth of 333 fathoms, in Lat.  $31^{\circ} 57' N.$ , Long.  $78^{\circ} 18' 35'' W.$

It agrees so closely with Schiödte and Meinert's description that I have little doubt of its identity with that Mediterranean species, although the body is proportionally narrower and the segments of the pleon more regularly curved above than represented in the figure of *Æ. incisa* given by those authors.

In our specimen the body is nearly three times as long as broad, sparingly punctate, well rounded above.

The head is rounded behind, presenting no ocular lobes; in front it is produced into a distinct, pointed process projecting downward between the bases of the antennulæ, separating them and nearly touching the frontal lamina, which is small and rhomboidal. The first two segments of the antennulæ are short and small, and rounded in front, not enlarged as in *Æ. psora* Krøyer; the third segment is longer than the first two, and is followed by a slender flagellum, longer than the peduncle, composed of about fifteen segments, of which the first is the longest, being as long as the next two, instead of "quam secundo paulo longiore," as in the typical specimen of the species. The antennæ, when reflexed, surpass the second thoracic segment; the flagellum is longer than the peduncle, and composed of less than twenty segments.

The eyes are large, and meet broadly on the median line; ocelli in about ten horizontal rows, half of which meet on the median line in front.

The first thoracic segment is longer than the second, thence they increase slowly in length to the fifth or sixth, and the seventh is short. The epimeral region of the first segment is marked by an obliquely descending depressed line. The epimera are all angulated behind, though only the last two are sensibly produced, and all are marked by one or two oblique curved lines, running downward and backward, the posterior one ending in the lower angle. The last epimeron does not attain the lateral angle of the first segment of the pleon. The legs are weak, and armed with but few small and short spinules throughout.

All the segments of the pleon are evident, but the first is very short above; the first four are distinctly angulated laterally. The telson is subtriangular, distinctly notched behind, as well as minutely crenulated and spinulose. The basal segment of the uropods is produced internally about half the length of the inner ramus, which is obliquely elongate triangular, larger and broader than the narrowly ovate outer one; both are ciliated and minutely denticulate.

Length, 13.5 mm.; breadth, 5 mm.

I have seen no other specimens.



*Rocinela oculata* sp. nov.

Plate III. Figs. 2-2a. Plate IV. Fig. 1,

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 on 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 (Pl. IV. Fig. 1) 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 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 equalling the telson; inner angle of basal segment produced, about one third the length of the inner ramus, which is ligulate, rounded behind, slightly shorter than the outer, and less than half as broad; outer ramus obovate, spinulose along the outer border; both rami ciliated except near the base.

Length, 13.5 mm.; breadth, 6 mm.



A single specimen of this species, the only one as yet known, was taken at Station 305, Lat.  $32^{\circ} 18' 20''$  N., Long.  $78^{\circ} 43'$  W., from a depth of 252 fathoms.

**Rocinela Americana** SCHIÖDTE & MEINERT.

**Plate III. Figs. 3, 3a, 4. Plate IV. Figs. 2, 2a.**

*Rocinela Americana* SCHIÖDTE & MEINERT, Naturhist. Tidssk., R. III., B. XII., p. 394, Pl. X. (Cym. IV.) Figs. 16-18. 1879.

Two specimens of this species were obtained at Station 320, Lat.  $32^{\circ} 33' 15''$  N., Long.  $77^{\circ} 30' 10''$  W., from a depth of 257 fathoms, and a considerable number of other specimens obtained at various localities by the U. S. Fish Commission enable me to add somewhat to Schiödte and Meinert's description of the species, which was drawn from a single female specimen. A comparison of their type, from Trenton,\* Maine, now preserved in the Museum of Comparative Zoölogy at Cambridge, and kindly loaned for the purpose by Professor Agassiz, shows no differences that can be regarded as specific.

The body is oval, with the length more than twice the breadth, and nearly all of our specimens are proportionally broader than the type, although none of them are quite as large.

Head subtriangular, rounded behind, acutish or slightly produced in front, more distinctly produced and somewhat angulated in front in the males (Pl. III. Fig. 4). Eyes rather large, separated by about one quarter the diameter of the head, rounded behind, more or less angulated at the point of nearest approach, where, in the males, a distinct angle of a hexagon is seen at the meeting of two rows of nine and six ocelli along the inner margin of the eye, one ocellus at the angle being common to both rows.

The antennulæ, when reflexed, only slightly surpass the head, and the flagellum is composed of five or six segments, of which the first is not much elongated and the last nearly attains the end of the antennal peduncle. The antennæ nearly attain the hinder margin of the second thoracic segment; the first and second segments are very short and concealed by the projecting front; the flagellum is as long as the peduncle, and composed of about fourteen segments.

The first thoracic segment is slightly excavated for the ocular lobes of the head; epimera of second and third segments subquadrate, oblique but not acute behind, marked with an impressed line near the lower margin; remaining four epimera acute and moderately produced; last epimeron usually surpassing the first segment of the pleon, although in some of the larger females, as in the type specimen, it fails to do so.

Prehensile legs (Pl. IV. Fig. 2) armed with three acute spines on the palmar margin of the propodus, and three obtuse spines on the same margin of the

\* Trenton is incorrectly printed "Ireston" in Schiödte and Meinert's paper.



merus; carpus short. Ambulatory legs (Pl. IV. Fig. 2 a), well armed with spines.

First segment of pleon small, nearly concealed by the last thoracic segment, and usually surpassed by the last pair of epimera, narrower than the three following segments, which are slightly broader than the last thoracic segment without the epimera. Last segment broader than long, rounded and ciliated behind, faintly furrowed on the median line posteriorly. Uropods about equal to the telson; basal segment more or less produced at the internal angle, outer ramus shorter than the inner, both rounded behind and ciliated, denticulated externally, with short spinules in the notches between the teeth.

The female specimens vary in length from 14 mm. to 25 mm. and in breadth from 6 mm. to 10 mm., being mostly slightly broader in proportion than the type specimen, which is 26.5 mm. long, 10 mm. broad. The large male in the Blake Collection is 28 mm. long, 12 mm. broad; the small female, 17.5 mm. by 7 mm. A male collected by the U. S. Fish Commission at Station 871 is 22 mm. long, 9.5 mm. broad.

The typical specimen of this species is destitute of color markings, which may however have faded out from exposure to the light. Nearly all the other specimens are rather distinctly marked, chiefly along the sides of the body, with dark brown, arranged as follows. The lateral margins of the first thoracic segment, and the epimera sometimes of the third, and usually of the fourth, fifth, and sixth segments, but not of the seventh, are dark or nearly black, and the color extends distinctly to the adjacent regions of the fourth segment, and may extend across the back along the hinder margin of this segment; the next two segments may be similarly, but less strongly marked. On the pleon the color appears as a curved or crescentic band, along the lateral margins of the second, third, and fourth segments, and across the back part of the fifth and fore part of the sixth segments. On the sixth segment the color when present is divided by the median line into two more or less distinct spots, or maculæ. The posterior part of the telson is lighter-colored than the body.

This species has also been obtained by the U. S. Fish Commission at the following stations:—

Station.	Fathoms	N. Lat.	W. Long.	Specimens.
871	115	40° 2' 54''	70° 23' 40''	5
874	85	40° 0'	70° 57'	Cast skin.
875	126	39° 57'	70° 57' 30''	1
897	157	37° 25'	74° 18'	2
1108	101	40° 2'	70° 37' 30''	1
Oct. 4, 1882	Trawl-line			1

#### *Rocinela* sp.

A single specimen, probably of an undescribed species of this genus, was obtained at Station 344, Lat. 40° 1' N., Long. 70° 58' W., from 129 fathoms.



This specimen, although 27 mm. in length, is not yet adult, as shown by the rudimentary condition of the seventh pair of legs, and differs from the preceding especially in having the eyes more finely granulated. The material is too incomplete to attempt a full description.

### ***Syscenus infelix* HARGER.**

**Plate III. Figs. 5, 5 a. Plate IV. Figs. 3 - 3 h.**

*Syscenus infelix* HARGER, Rep. U. S. Fish Com., Pt. IV. for 1878, p. 387. 1880.

Three specimens of this species were obtained at two localities; viz. a single female at Station 303, Lat.  $41^{\circ} 34' 30''$  N., Long.  $65^{\circ} 54' 30''$  W., from 306 fathoms, and two males at Station 309, Lat.  $40^{\circ} 11' 40''$  N., Long.  $68^{\circ} 22'$  W., from 304 fathoms. Besides these specimens a considerable number have also been obtained by the U. S. Fish Commission, from various localities along the coast as far south as Delaware Bay, and from a depth as great as 372 fathoms, so that the species, originally described from a single specimen, has now become comparatively common in the collection, and I am enabled to make some corrections in the description already given, as well as to add further details and present figures of the species.

Many of the specimens since obtained are larger than the type, and such examples often have the body quite distinctly corrugated and rather coarsely pitted, especially upon the head and the anterior part of the thorax or pereion. In some of the larger males the ocular regions on each side of the head are swollen and distinctly pitted and corrugated. On the lateral margin of the head is a notch, into which may be received a short process on the anterior angle of the first segment, thus producing a very firm articulation when the head is drawn closely against the first segment. The flagellum of the antennula is usually composed of seven segments instead of six, but the number may be different on opposite sides of the same specimen. A bottom view of the head, enlarged eight diameters, is given on Plate IV. Fig. 3, showing the antennary organs, the right antenna being removed to show the antennula of that side.

The maxillipeds (Pl. IV. Fig. 3 c) are robust, thickened along the inner or median side where they meet; the first segment of the palpus is large, nearly square, and armed at its inner distal angle with a single hook; its distal margin is shorter than the proximal, and is angulated at the articulation with the second short transverse segment. This segment is armed distally with three hooks, of which the anterior appears to be articulated and should perhaps be regarded as a third segment of the palpus. The outer or second maxillæ are thin, delicate, and obscurely lobed at the tip, where they are armed with a single small hook. The inner or first maxillæ (Pl. IV. Figs. 3 b, 3 b') are armed with spines, of which the inner are shorter and straight, the outer are larger and



curved or hooked at the tip. The mandibles (Pl. IV. Fig. 3 a) are robust at base, but slender and acute at the tip.

In the prehensile, or first three pairs of legs, the merus, carpus, and propodus are each armed with a short, curved, blunt spine on the palmar margin, as shown in the figure of a leg of the first pair on Plate IV. Fig. 3 d. The remaining four pairs of legs, not all natatory, are well fitted for prehension by their slender curved claws, and differ considerably in their proportions in specimens of different sizes, as shown by the accompanying table of measurements. All the legs are strongly flexed at the articulation of the basis with the ischium. In the sixth and seventh pairs, the ischium, merus, carpus, and propodus are elongated and in the small specimens slender, so that, with the addition of the dactylus, the last five segments of the leg of the sixth pair may attain to five sixths or even seven eighths the length of the body. The bases do not participate in this elongation and are therefore omitted in the measurements, since to include them would only diminish the contrast between the large and small specimens, shown especially in the last six columns of the table. In large specimens, like the one figured, the sixth and seventh pairs of legs are much more robust than in smaller ones.

The pleopods (Pl. IV. Fig. 3 g) are not naked, as originally described, but all the anterior ones, as usual in the *Ægidæ*, are distinctly ciliated. The cilia are however short and not very evident, and were overlooked in the single specimen described. In the small specimens they are proportionally longer than in larger ones. The second pair of pleopods in the male (Pl. IV. Fig. 3 g) bears a slender stylet tapering to the tip, and about as long as the ramus to which it is attached. In the small specimen, whose measurements are given in the last column of the table, the stylet is blunt, and considerably shorter than the ramus. The uropods (Pl. IV. Fig. 3 h) are robust; the basal segment is oblique, but not much produced internally; the rami are well ciliated.

Professor Verrill states that in life this species is bright colored, varying from bright orange to salmon-colored above and light yellow underneath. This color soon fades in alcohol.

Considerable variations in size, and corresponding variations in the proportions, especially of the sixth and seventh pairs of legs, are shown in the following table of measurements, in which the first three columns contain measurements of the Blake Expedition specimens, the next four columns contain measurements of specimens obtained at a single locality (Station 945) off Martha's Vineyard, by the U. S. Fish Commission in the summer of 1881, while in the last column are measurements of a smaller specimen obtained by the Fish Commission at another locality (Station 1028) in the same region. The measurements in the fourth column are from the specimen figured on Plate III. Figs. 5 and 5 a; those of the next five columns are from specimens gradually decreasing in size to the last. The length of the ambulatory legs, especially those of the sixth and seventh pairs, is seen to increase proportionally as the length of the body diminishes, except in the case of the seventh pair of legs of the last specimen. This is doubtless to be explained as a mark of



immaturity in addition to the one already noted in the second pair of pleopods. The measurements are in millimeters, and the proportion of each to the length of the body is indicated by the accompanying decimal.

## MEASUREMENTS.\*

<i>Syscenus infelix</i> H.	B. ♀ 303	B. ♂ 309	B. ♂ 309	F. C. ♂ 945	F. C. ♂ 945	F. C. ♂ 945	F. C. ♀ 945	F. C. ♀ 945	F. C. ♂ 1028
Length of body . . . . .	1.00 24.5	1.00 31.0	1.00 30.0	1.00 44.0	1.00 32.0	1.00 27.0	1.00 25.0	1.00 18.0	1.00 15.0
Transverse diameter of head . . . . .	.16 3.8	.16 5.0	.15 4.5	.14 6.0	.16 5.0	.15 4.0	.16 4.0	.18 3.2	.19 2.8
“ “ 1st segment . . . . .	.33 8.0	.29 9.0	.31 9.2	.28 12.5	.28 9.0	.30 8.0	.32 8.0	.33 6.0	.33 5.0
“ “ 3d segment . . . . .	.36 8.8	.35 11.0	.35 10.5	.34 15.0	.33 10.5	.33 9.0	.36 9.0	.41 7.4	.35 5.2
“ “ 7th segment . . . . .	.27 6.5	.26 8.0	.27 8.0	.26 11.5	.25 8.0	.23 6.2	.26 6.6	.25 4.5	.27 4.0
“ “ pleon at base . . . . .	.20 5.0	.18 5.5	.18 5.5	.19 8.0	.17 5.5	.17 4.5	.20 5.0	.20 3.6	.20 3.0
“ “ last segment of pleon . . . . .	.23 5.6	.23 7.2	.26 7.8	.25 11.2	.24 7.5	.21 5.6	.23 5.8	.22 4.0	.21 3.2
Longitudinal diameter of last segment of pleon . . . . .	.23 5.6	.26 8.0	.29 8.6	.27 12.0	.26 8.2	.21 5.6	.23 5.8	.25 4.5	.27 4.0
Length, beyond basis, of leg of 3d pair . . . . .	.18 4.5	.16 5.0	.17 5.0	.14 6.0	.18 5.2	.15 4.0	.17 4.2	.17 3.0	.20 3.0
“ “ “ “ 4th pair . . . . .	.30 7.0	.26 8.0	.27 8.0	.25 11.0	.25 8.0	.26 7.0	.28 7.0	.28 5.0	.33 5.0
“ “ “ “ 5th pair . . . . .	.37 9.0	.35 11.0	.33 10.0	.30 13.0	.31 10.0	.33 9.0	.34 8.5	.42 7.5	.40 6.0
“ “ “ “ 6th pair . . . . .	.66 16.0	.58 18.0	.53 16.0	.45 20.0	.50 16.0	.63 17.0	.68 17.0	.83 15.0	.87 13.0
“ “ “ “ 7th pair . . . . .	.53 13.0	.50 15.5	.47 14.0	.41 18.0	.42 13.5	.54 14.6	.60 15.0	.67 12.0	.61 9.2

\* In the table of measurements B. is used to denote the Blake Expedition, F. C. the U. S. Fish Commission, and the accompanying numbers refer to the stations at which the specimens were obtained. The measurements are in millimeters, and over each is placed in small figures the corresponding decimal part of the length of the body.

NEW HAVEN, September 6, 1883.



## EXPLANATION OF THE PLATES.

## PLATE I.

- Fig. 1. *Cirolana polita* Harger ex Stimpson. Lateral view of female, enlarged three diameters.
- " 1 a. Antennula of another specimen, enlarged twelve diameters.
- " 1 b. Antenna of same, enlarged twelve diameters.
- " 1 c. Lateral view of pleon of *C. polita* as in fig. 4, enlarged five diameters.
- " 2. *Cirolana spinipes* Bate & Westwood. Lateral view of female, enlarged three diameters.
- " 2 a. Antennula of another specimen, enlarged ten diameters.
- " 2 b. Antenna of same, enlarged ten diameters.
- " 2 c. Pleon of *C. spinipes* as in fig. 4, enlarged five diameters.
- " 2 d. Pleopod of the second pair of *C. spinipes*, male, enlarged eight diameters.
- " 3. *Cirolana impressa* Harger. Lateral view of female, enlarged three diameters.
- " 3 a. Antennula of another specimen, enlarged twelve diameters.
- " 3 b. Antenna of same specimen, enlarged twelve diameters.
- " 3 c. Pleon of *C. impressa* as in fig. 4, enlarged five diameters.
- " 3 d. Pleopod of the second pair of *C. impressa*, male, enlarged eight diameters.
- " 4. Pleon of *Cirolana concharum* Harger ex Stimpson, showing the first five segments in a lateral view, with dotted outline of last thoracic segment and its epimeron, enlarged five diameters.

## PLATE II.

- Fig. 1. *Cirolana spinipes* Bate & Westwood. Last segment of pleon with uropods, enlarged six diameters.
- " 1 a. Leg of the first pair, enlarged eight diameters.
- " 1 b. Leg of the fourth pair, enlarged six diameters.
- " 1 c. Leg of the seventh pair, enlarged six diameters.
- " 2. *Cirolana polita* Harger ex Stimpson. Last segment of pleon with uropods, enlarged six diameters.
- " 2 a. Leg of the first pair, enlarged eight diameters.
- " 2 b. Leg of the fourth pair, enlarged eight diameters.
- " 3. *Cirolana impressa* Harger. Last segment of pleon with uropods, enlarged six diameters.



- Fig. 3 a. Leg of the first pair, enlarged eight diameters.  
 " 3 b. Leg of the fourth pair, enlarged eight diameters.  
 " 3 c. Leg of the seventh pair, enlarged eight diameters.  
 " 4. *Cirolana concharum* Harger ex Stimpson. Last segment of pleon with uropods, enlarged six diameters.  
 " 4 a. Leg of the first pair, enlarged eight diameters.  
 " 4 b. Leg of the fourth pair, enlarged eight diameters.  
 " 4 c. Leg of the seventh pair, enlarged eight diameters.

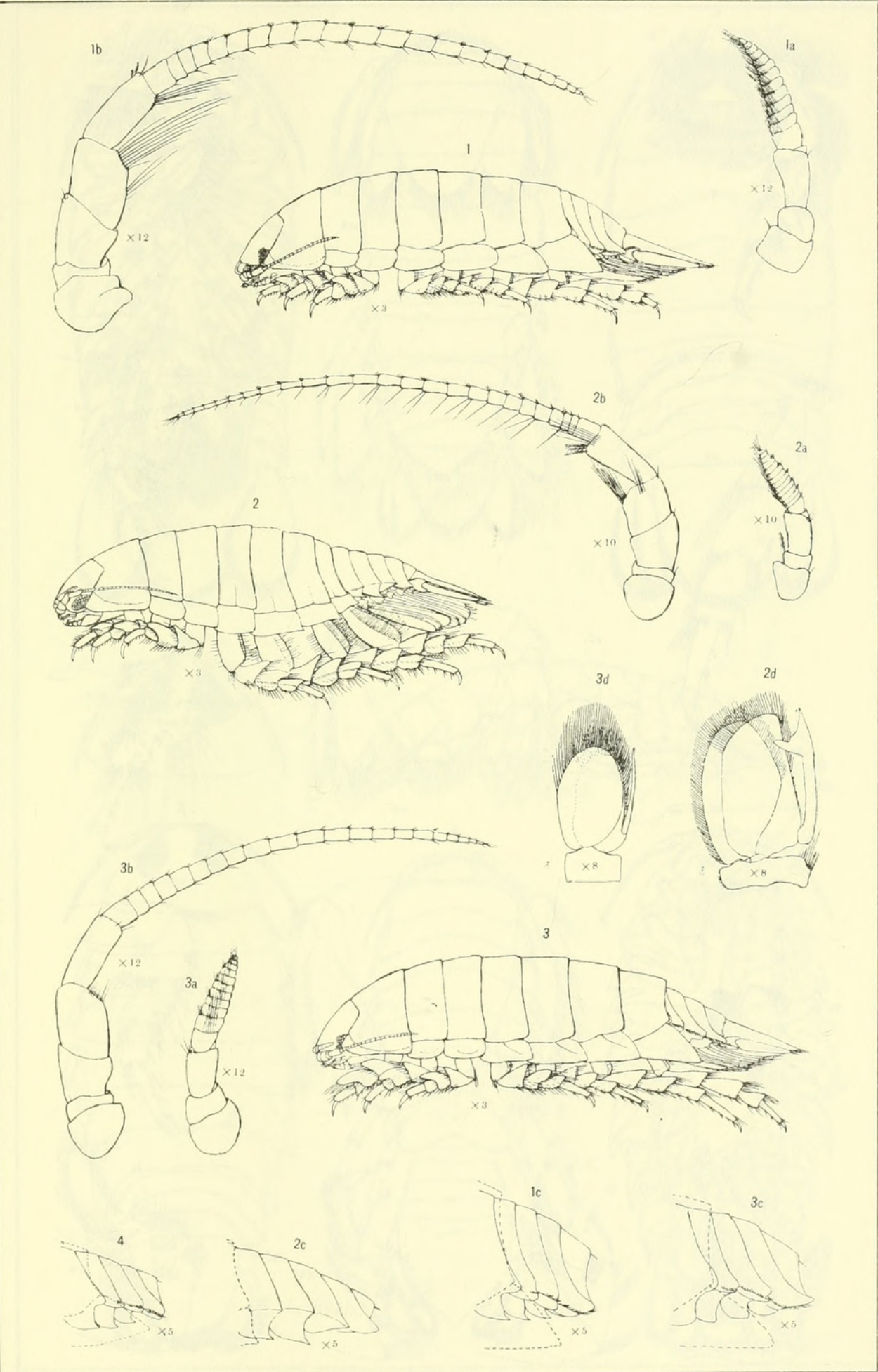
## PLATE III.

- Fig. 1. *Aega incisa* Schiödte & Meinert. Dorsal view of specimen from Station 307, enlarged five diameters.  
 " 2. *Rocinela oculata* Harger. Dorsal view of specimen from Station 305, enlarged six diameters.  
 " 2 a. Ventral view of same specimen, enlarged six diameters.  
 " 3. *Rocinela Americana* Schiödte & Meinert. Dorsal view of female, enlarged three diameters.  
 " 3 a. Ventral view of same specimen, enlarged three diameters.  
 " 4. *Rocinela Americana* Schiödte & Meinert. Head and first thoracic segment of male, enlarged three diameters.  
 " 5. *Syscenus infelix* Harger. Dorsal view of male, enlarged one and one half diameters.  
 " 5 a. Lateral view of same specimen, enlarged one and one half diameters.

## PLATE IV.

- Fig. 1. *Rocinela oculata* Harger. Leg of the first pair from specimen figured on Plate III., enlarged fifteen diameters.  
 " 2. *Rocinela Americana* Schiödte & Meinert. Leg of the first pair, enlarged ten diameters.  
 " 2 a. Leg of the sixth pair of the same, enlarged six diameters.  
 " 3. *Syscenus infelix* Harger. Inferior view of the head, right antenna removed to show the antennula, enlarged eight diameters.  
 " 3 a. Left mandible of same, enlarged twenty diameters.  
 " 3 b. Maxilla of the first or inner pair, enlarged twenty diameters.  
 " 3 b'. Tip of same, enlarged about seventy-five diameters.  
 " 3 c. Left maxilliped of same, enlarged twenty diameters.  
 " 3 d. Leg of the first pair of same, enlarged four diameters.  
 " 3 e. Leg of the fourth pair of same, enlarged four diameters.  
 " 3 f. Leg of the sixth pair of same, enlarged four diameters.  
 " 3 g. Pleopod of the second pair of same, male, enlarged four diameters.  
 " 3 h. Uropod of same, enlarged four diameters.



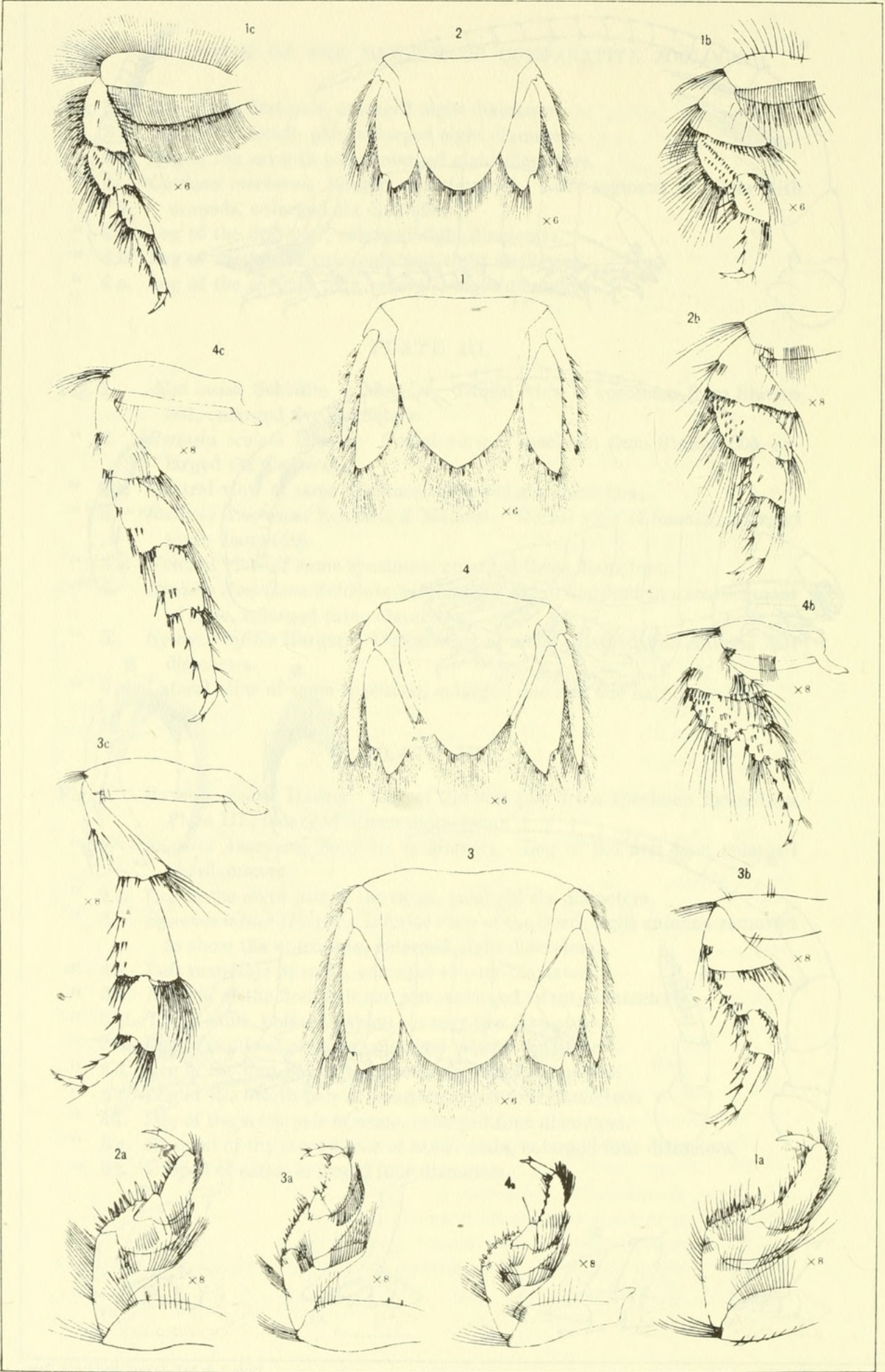


O. Harger, from Nature.

Photo. Lith. by E. Grisand, New Haven, Conn.

CIROLANA POLITA, C. SPINIPES, C. IMPRESSA, C. CONCHARUM.



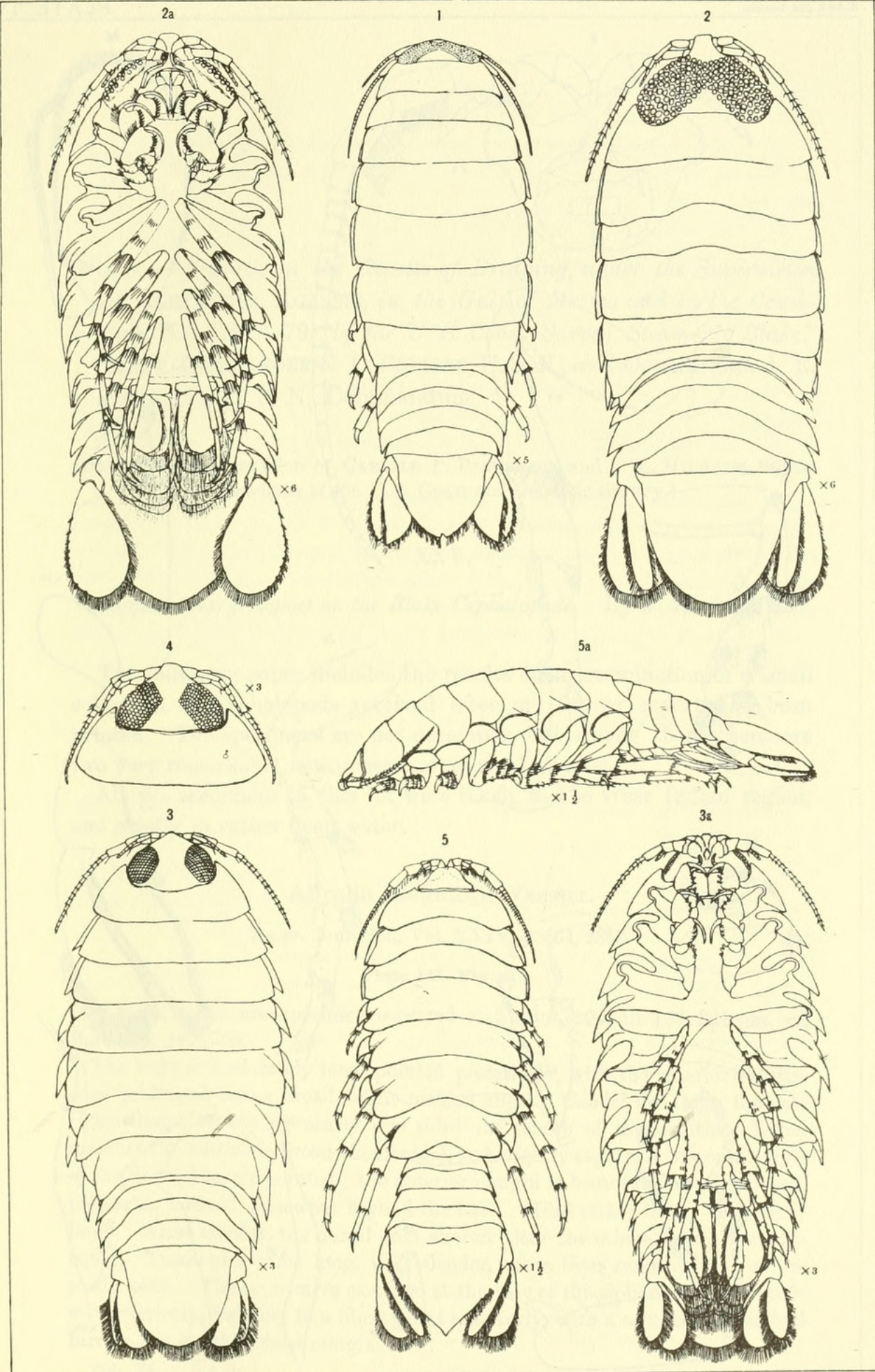


O. Harger, from Nature.

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CIROLANA POLITA, C. SPINIPES, C. IMPRESSA, C. CONCHARUM.



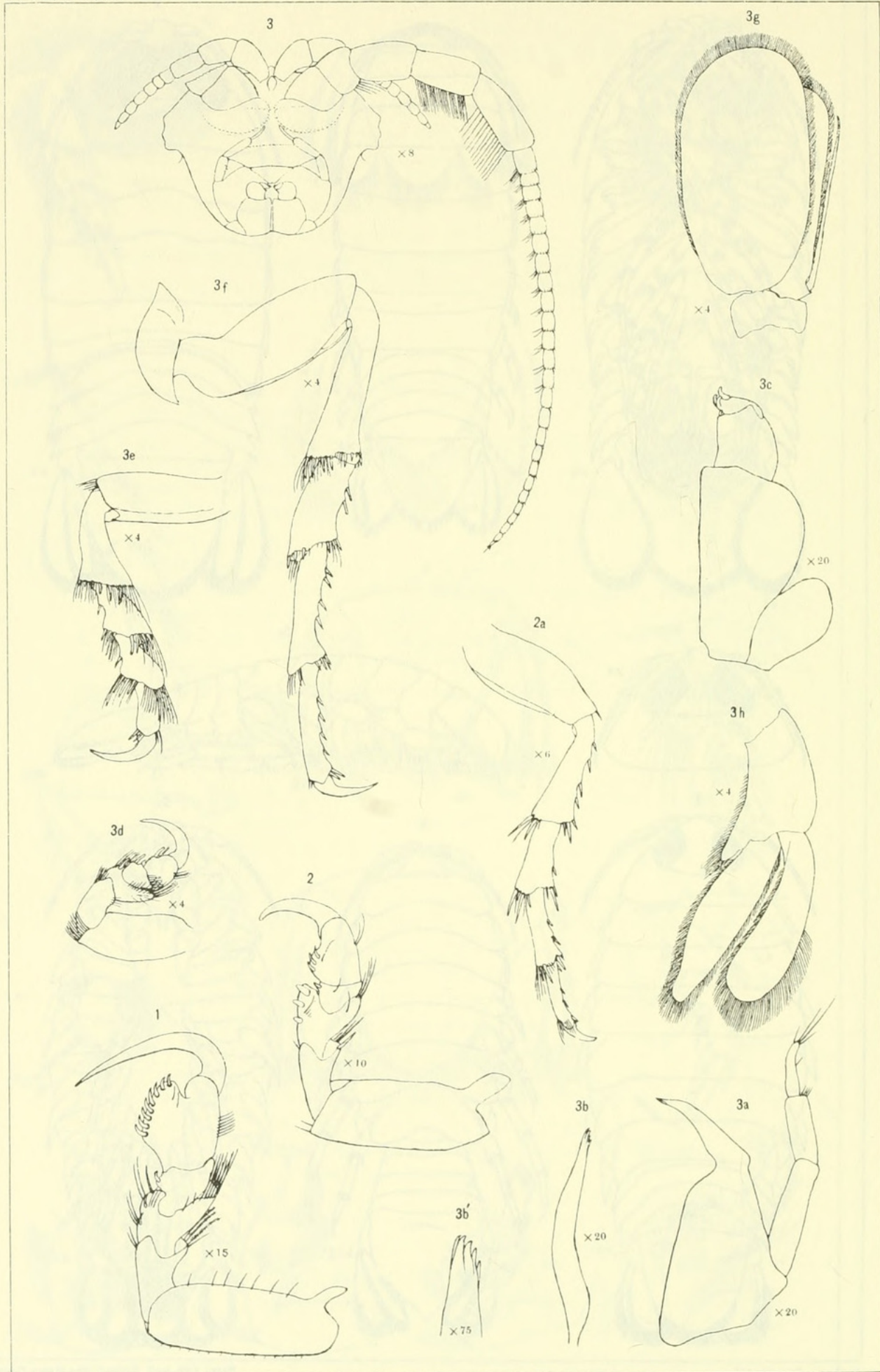


O. Harger, from Nature.

Photo. Lith. by E. Crisand, New Haven, Conn.

AEGA, ROCINELA, SYSCENUS.





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