
ISOPODS FROM THE ALASKA SALMON INVESTIGATION.

By HARRIET RICHARDSON, Ph. D.,
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The present paper is one of a series based on the collections of the Fisheries steamer *Albatross* in Alaska, while engaged in the salmon investigation during the summer of 1903. Four new species of Isopoda are described herein, one of which is the type of a new genus. A list of other Isopoda collected during the expedition is given and *Rocinela angustata* Richardson is figured again.

FLABELLIFERA OR CYMOTHOIDEA.

Family ÆGIDÆ.

Æga symmetrica Richardson, new species.

Body ovate, twice as long as broad. Color yellow, densely covered with light brown dots, which form a regular line along the margin of each segment. Surface smooth.

Head with frontal margin produced in a median point, which arches over the basal joints of the antennæ and meets the frontal lamina or interantennal plate on the under side. The eyes are narrow and elongate, composed of numerous ocelli. They are separated in front by a distance equal to the length of one eye. The first pair of antennæ extend to the posterior margin of the first thoracic segment; the joints of the peduncle are not dilated, although the first two joints are somewhat wider than the third, nor is there a process at the distal extremity of the second joint. The first two joints are of equal length; the third is as long as the first two together; the flagellum is composed of eleven joints. The second pair of antennæ reach the middle of the third thoracic segment; the flagellum is composed of sixteen joints. The frontal lamina or interantennal plate is conical, with the distal end flat, the proximal end produced to an acute point.

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

The first three pairs of legs have the propodus beset with three small spines along the inner margin; the carpus is short and armed with one spine; the merus is provided with five spines, and the ischium has one long spine at the outer distal angle. The following four pairs of legs are long and slender furnished with hairs at the distal extremity of the joints and armed with a few spines.

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

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

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

Only two other species of *Aega* are known in the Pacific coast fauna, *Aega lecontii* (Dana*) and *Aega microphthalma* Dana †. The present species differs from *Aega lecontii* (1) in the greater length of

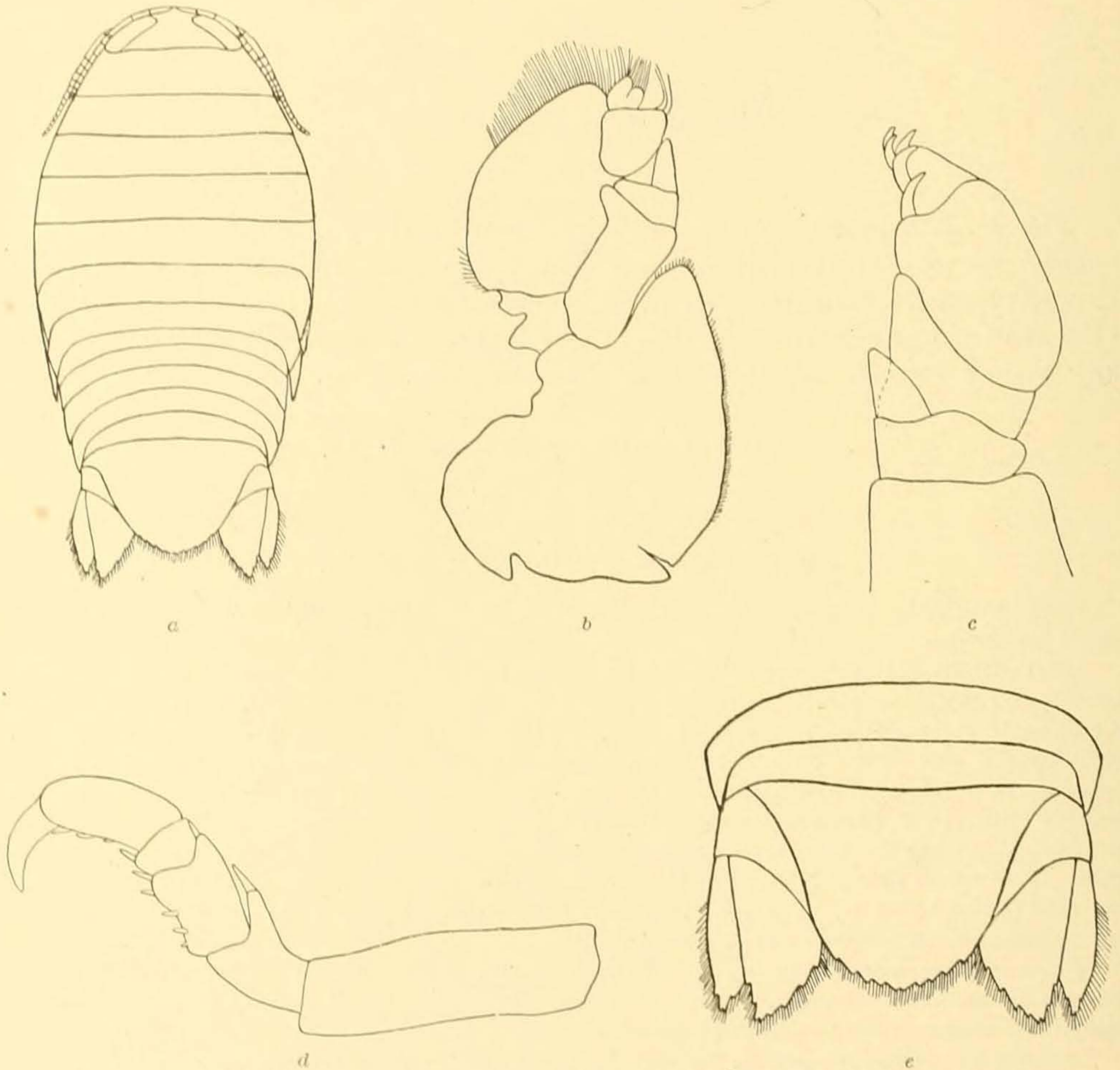


FIG. 1.—*Aega symmetrica* Richardson, new species. *a*, General view, $\times 4$; *b*, maxilliped, $\times 41$; *c*, maxilliped, $\times 77$; *d*, leg of third pair, $\times 18\frac{1}{2}$; *e*, last three segments of abdomen with uropoda, $\times 8\frac{3}{4}$.

both pairs of antennæ; those of the first pair reach to the posterior margin of the first thoracic segment, instead of to the end of the peduncle of the second pair or almost to the posterior margin of the head, and those of the second pair reach to the middle of the third thoracic segment instead of almost to the posterior margin of the first; (2) in having neither the basal joint of the peduncle of the first pair of antennæ greatly dilated nor the second joint with a process at the apex extending nearly the length of the third joint; (3) in the much shorter body, as compared with the width; (4) in having the ter-

*See Proc. U. S. Nat. Museum, XXI, 1899, pp. 826-827.

†See Proc. Acad. Nat. Sci. Phil., VII, 1854, p. 176.

minal segment rounded, not truncate, at the apex; (5) in the longer uropoda; (6) in having the median point of the frontal margin of the head arch over the basal joints of the antennæ to meet the frontal lamina on the ventral side, and (7) in the different shape of the frontal lamina.

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

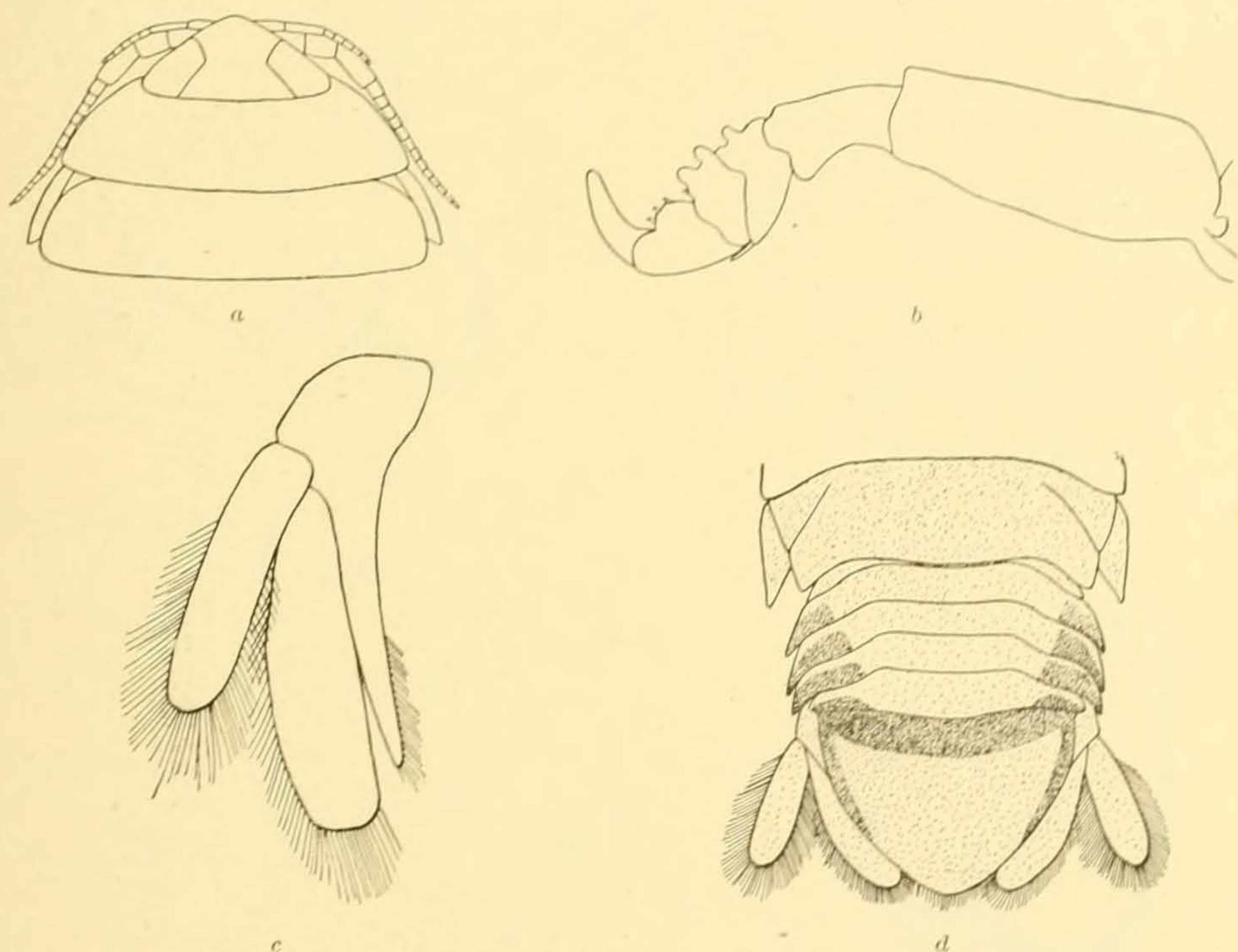


FIG. 2.—*Rocinela belliceps* (Stimpson). a, Head and antennæ, $\times 3\frac{1}{2}$; b, leg of third pair, $11\frac{1}{2}$; c, uropod, $\times 8\frac{3}{4}$; d, abdomen, $\times 3\frac{1}{2}$.

***Rocinela belliceps* (Stimpson).**

Aega belliceps Stimpson, Proc. Acad. Nat. Sci. Phila., XVI, 1864, p. 155.

Aega alaskensis Lockington, Proc. Cal. Acad. Sci., VII, 1877, pt. 1, p. 46.

Rocinela alaskensis Richardson, Proc. Am. Phil. Soc., XXXVII, 1898, p. 11.

Rocinela belliceps Richardson, Proc. U. S. Nat. Museum, XXI, 1899, p. 827.

Localities.—Stations 4197 and 4193, Gulf of Georgia, Halibut Bank; station 4200, Queen Charlotte Sound, off Fort Rupert, British Columbia; station 4218, Admiralty Inlet, vicinity of Port Townsend; stations 4233 and 4236, vicinity of Yes Bay, Behm Canal; station 4247, Kasaan Bay, Prince of Wales Island, Southeast Alaska; stations 4269 and 4268, Afognak Bay, Afognak Island, Central Alaska; station 4282, Chignik Bay, Alaska Peninsula. Depth, 14–182 fathoms.

Rocinela angustata Richardson.

Rocinela laticauda Richardson (not Hansen), Proc. Am. Philos. Soc., XXXVII, 1898, No. 157, pp. 14-15, figs. 5-6; Proc. U. S. Nat. Museum, XXI, 1899, p. 828.

Rocinela angustata Richardson, Proc. U. S. Nat. Museum, XXVII, 1904, p. 33.

Localities.—Station 4248, Eastern Passage (vicinity of Stikine River Delta), Southeast Alaska; station 4235, vicinity of Yes Bay, Behm Canal. Depth, 67-181 fathoms.

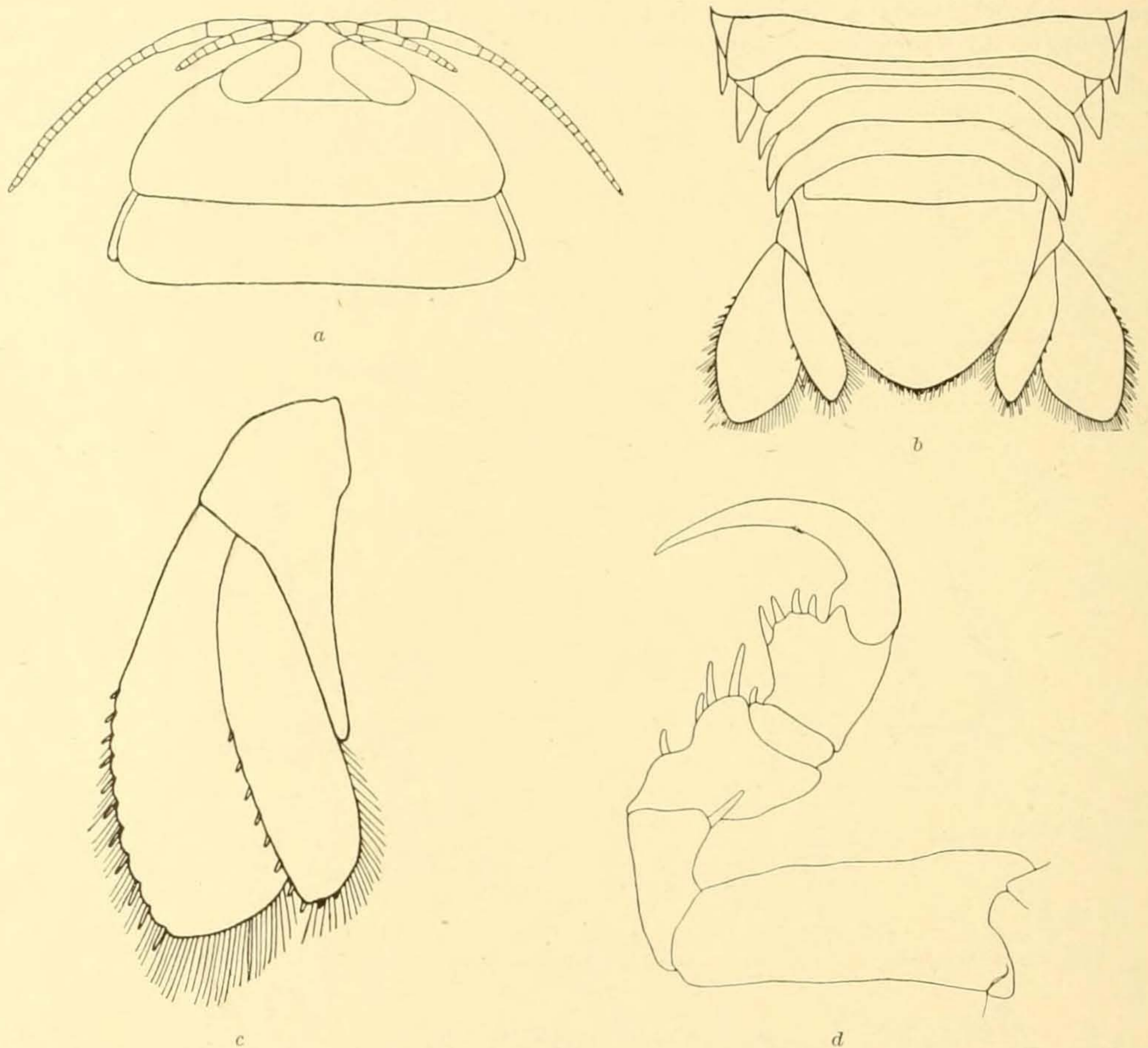


FIG. 3.—*Rocinela angustata* Richardson. *a*, Head with antennæ, $\times 3$; *b*, abdomen with uropoda, $\times 3$; *c*, right uropod, $\times 8\frac{3}{4}$; *d*, leg of third pair, $11\frac{1}{4}$.

Rocinela propodialis Richardson, new species.

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

Head triangular and produced in front in a broad median process. Eyes large and separated in front by a distance equal to the length of one eye. The first pair of antennæ extend to the posterior margin of the head or to the end of the peduncle of the second pair; the flagellum has four to six joints. The second pair of antennæ reach the posterior margin of the second thoracic segment; the flagellum has 16 joints.

The several segments of the thorax are about equal in length, the first segment being a little longer and the last a little shorter than any of the others. The epimera of all the segments are

produced at the outer posterior angle, becoming more and more pointed in the last 4 segments. The epimera of the last segment only project beyond the posterior margin of the segment.

The first segment of the abdomen is entirely concealed by the last thoracic segment. The fifth is narrower than the preceding ones, but longer in the median line. The terminal abdominal segment is linguiform, rounded posteriorly, with smooth margins furnished with short hairs.

The uropoda do not exceed in length the terminal abdominal segment. The outer branch is somewhat narrower and is shorter than the inner, and both branches are armed with a few short spines along the outer margins, and with long hairs along the inner margins.

The first three pairs of legs have the propodus armed with a process, the edge of which is denticulate with six teeth meeting squarely and without interval, forming an unbroken line; the carpus is armed with one inconspicuous spine; the merus has five short blunt spines along the inner

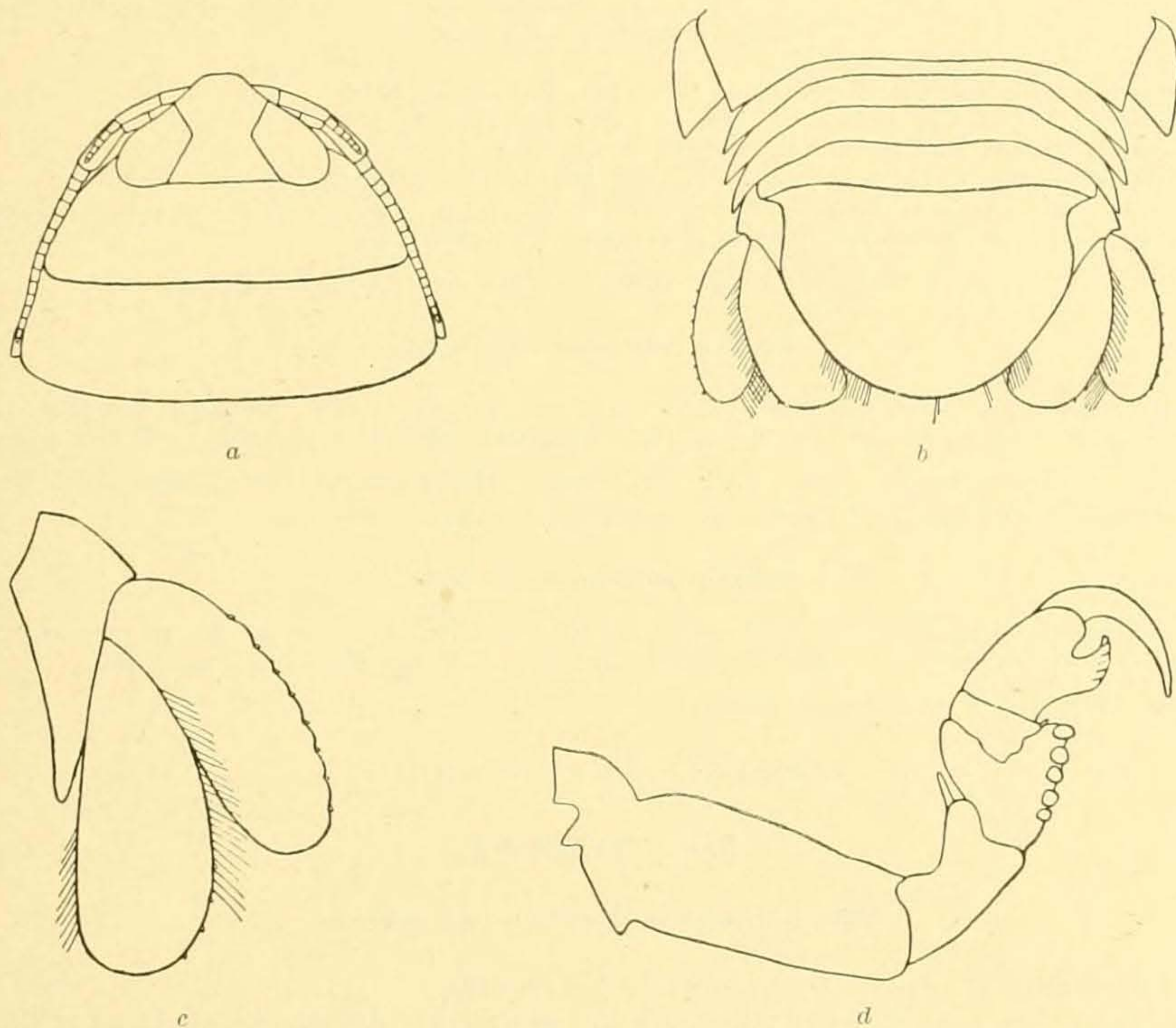


FIG. 4.—*Rocinela propodialis* Richardson, new species. *a*, Head with antennæ, $\times 3\frac{1}{2}$; *b*, abdomen with uropoda, $\times 3\frac{1}{2}$; *c*, right uropod, $\times 8\frac{2}{3}$; *d*, leg of third pair, $11\frac{1}{2}$.

margin, and the ischium is furnished with one long spine at the outer distal angle. The last four pairs of legs are armed with numerous spines.

Only one specimen, a male, and the type (No. 29248 U. S. Nat. Mus.), was taken by the *Albatross*, at station 4205, Admiralty Inlet, vicinity of Port Townsend, at a depth of 15–26 fathoms.

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

*See Proc. U. S. Nat. Mus., Vol. XXVII, 1904, p. 33.

Family SPHÆROMIDÆ.

Sphæroma oregonensis Dana.

Sphæroma oregonensis Dana, U. S. Expl. Exp. Crust. XIV, 1853, II, p. 778, pl. LII, fig. 4; Proc. Acad. Nat. Sci. Phila., VII, 1854, p. 177. Stimpson, Journ. Bos. Soc. Nat. Hist., VI, 1857, p. 69.

Sphæroma olivacea Lockington, Proc. Cal. Acad. Sci., VII, 1877, pt. 1, p. 45.

Sphæroma oregonensis Richardson, Proc. U. S. Nat. Mus., XXI, 1899, p. 836.

Locality.—Not given.

VALVIFERA OR IDOTEOIDEA.

Family IDOTEIDÆ.

Idotea vosnesenskii Brandt.

Idotea vosnesenskii Brandt, Middendorff's Sibirische Reise, 1851, Zool., II, Cr., p. 146.

Idotea hirtipes Dana, Cr., U. S. Expl. Exp., XIV, 1853, pt. 2, p. 704, pl. XLVI, fig. 6.

Idotea vosnesenskii Stimpson, Bost. Journ. Nat. Hist., VI, 1857, p. 504.

Idotea media (Dana?) S. Bate, in Lord's Naturalist in British Columbia, II, 1866, p. 282.

Idotea vosnesenskii S. Bate, in Lord's Naturalist in British Columbia, II, 1866, p. 281. Miers, Journ. Linn. Soc. London, XVI, Zoology, 1883, p. 40. Richardson, Proc. U. S. Nat. Mus., XXI, 1899, p. 846.

Localities.—Taylor Bay, Gabriola Island; head of Mink Arm, Boca de Quadra.

Idotea resecata Stimpson.

Idotea resecata Stimpson, Bost. Journ. Nat. Hist., VI, 1857, p. 64, pl. XXII, fig. 7; Proc. Bost. Soc. Nat. Hist., 1859, p. 88. Miers, Journ. Linn. Soc. London, XVI, p. 45, 1883. Richardson, Proc. U. S. Nat. Mus., XXI, 1899, p. 844.

Localities.—Kilisut Harbor, near Port Townsend; Marrowstone Point, near Port Townsend; Quarantine Dock, Port Townsend; Karta Bay, Southeast Alaska.

Idotea ochotensis Brandt.

Idotea ochotensis Brandt, Middendorff's Sibirische Reise, II, 1851, Crust., p. 145, pl. VI, fig. 33. Miers, Journ. Linn. Soc. London, XVI, 1883, p. 32, pl. I, figs. 8-10. Richardson, Proc. U. S. Nat. Mus., XXI, 1899, p. 846.

Locality.—Karta Bay, Southeast Alaska.

ASELLOTA OR ASELLOIDEA.

Family JANIRIDÆ.

Tole holmesi Richardson, new species.

Body yellow in color, spotted with numerous brown dots.

Head broader than long, with frontal margin almost straight, very slightly produced in the middle. On either side, a little anterior to the middle of the lateral margin, is a process terminating in two spines. The eyes are large, composite, and situated near the lateral margin, about halfway between the posterior and anterior margins of the head. The first pair of antennæ extend to the end of the fourth joint of the peduncle of the second pair; the basal joint of the peduncle is large, dilated; the two following joints are slender; the flagellum consists of twenty joints. The second pair of antennæ are longer than the body. The first three joints are short, with an articulated exopod on the third joint; the fourth and fifth joints are very long, the fourth being slightly longer than the fifth; the flagellum consists of numerous joints.

The posterior portion of the lateral margin of the first segment of the thorax is produced on either side into a triangular process; the epimeron is situated at the anterior portion of the lateral margin and is produced in a triangular process about as long as the posterior one. The antero- as well as the postero- lateral angles of the second and third segments are each produced in a long process, with the bifurcate epimeron situated between them. The anterior portion only of the lateral margin of the fourth segment is produced with the bifurcate epimeron situated at the posterior portion of the segment. The fifth, sixth, and seventh segments have the anterior portion of the lateral margin produced in a

process which extends outward and downward and in the last segment is triangularly produced at the posterior extremity, the epimeron in each segment occupying the posterior portion of the segment.

The abdomen is composed of a single segment whose posterior margin has a widely rounded median expansion with an acutely pointed lateral expansion on either side. The uropoda are about equal to the abdomen in length; the outer branch is slightly shorter than the inner; the basal joint is equal in length to the outer branch.

The legs are all furnished with biunguiculate dactyli. The first pair is prehensile, the carpus being very large and armed with spines along the inner margin; the propodus is serrulate along the inner margin of the proximal end.

Two specimens, both females, were taken by the *Albatross* at station 4253, Stephens Passage, Southeast Alaska, and station 4228, vicinity of Naha Bay, Behm Canal, Southeast Alaska. Depth, 41-188 fathoms. Type in the U. S. National Museum, Cat. No. 29249. This species is named for Dr. Samuel J. Holmes, who has done much work on the crustacea of the Pacific coast.

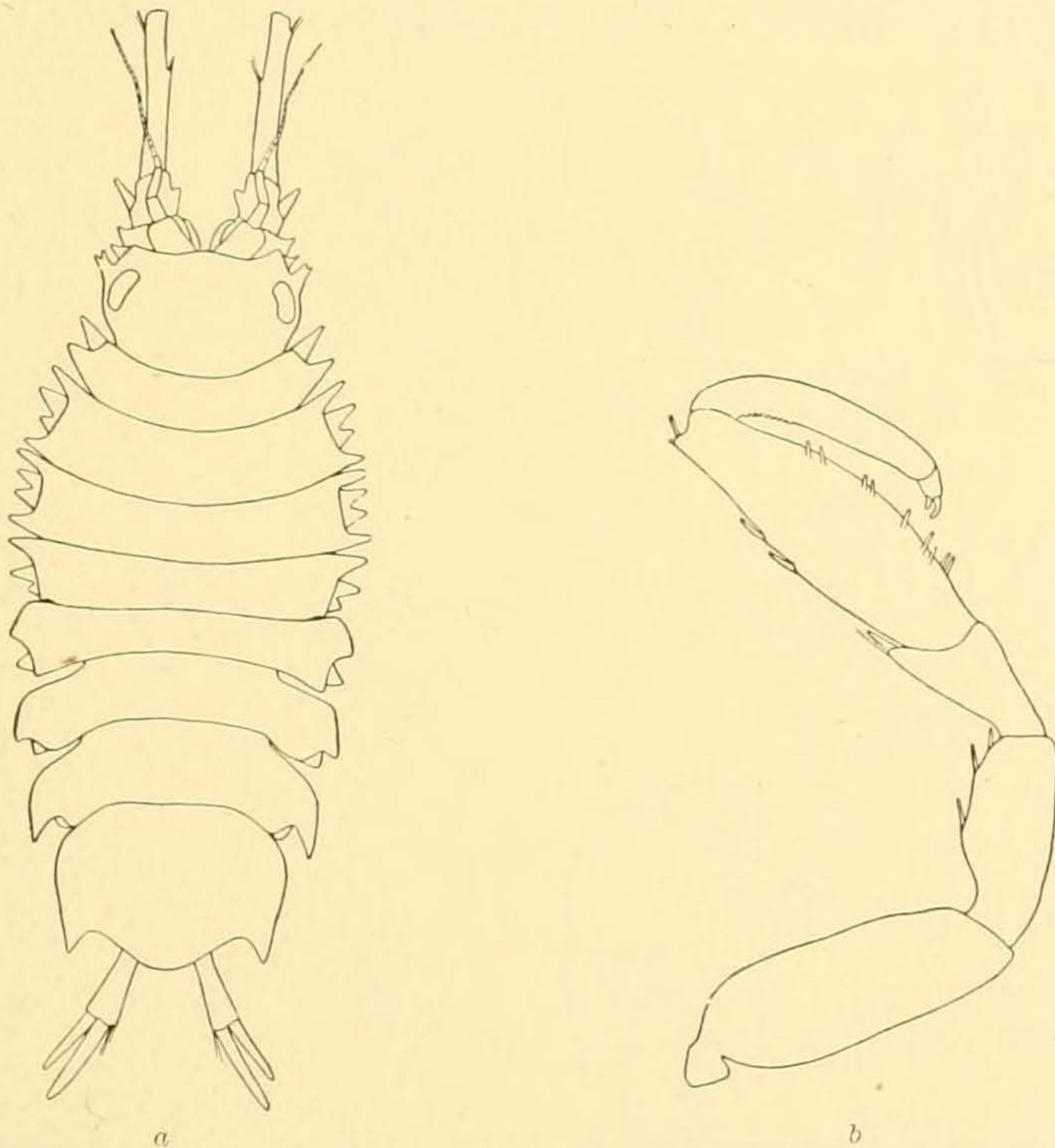


FIG. 5.—*Tole holmesi* Richardson, new species. *a*, General view, $\times 11\frac{1}{2}$; *b*, leg of first pair, female, $\times 33$.

ONISCOIDEA.

Family ONISCIDÆ.

Porcellio scaber Latreille.

Porcellio scaber Latreille, Hist. Crust. Ins., VII, p. 45; Gen. Crust., I, p. 70. Budde-Lund, Crust. Isop. Terrestria, 1885, pp. 129-131. (See Budde-Lund for synonymy.)

Localities.—Vancouver Island, British Columbia, near Union Wharf, along the shore; Taylor Bay, Gabriola Island, British Columbia, on the shore.

EPICARIDEA OR BOPYROIDEA.

Family BOPYRIDÆ.

Bopyroides hippolytes (Krøyer).

Bopyrus hippolytes Krøyer, Grønlands Amphipoder, 1838, p. 306 (78), pl. iv, fig. 22; Monog. Fremst. Slægten Hippolytes Nordeske Arter, 1842, p. 262; Voy. en Scand., Crust., 1849, pl. xxviii, fig. 2. Edwards, Hist. Nat. des Crust., III, 1840, p. 283. Stimpson, Proc. Acad. Nat. Sci. Phila., 1863, p. 140.

Bopyroides acutimarginatus Stimpson, Proc. Acad. Nat. Sci. Phila., 1864, p. 156.

Gyge hippolytes Miers, Ann. Mag. Nat. Hist. (4), XX, 1877, p. 64 (14). Smith in Harger, Proc. U. S. Nat. Mus., II, 1879, p. 157. Harger, Rep. U. S. Fish Comm., 1880, pt. 6, p. 311. (See Harger for synonymy and bibliography.) Axel Ohlin, Bidrag till Kannedomen om Malakostrak-faunan in Baffin Bay och Smith Sound, 1895, p. 19.

Bopyroides hippolytes G. O. Sars, Crust. Norway, II, 1899, pp. 199-200, pl. LXXXIV, fig. 2. Bonnier, Travaux de la Station Zool. de Wimereux, VIII, 1900, pp. 373-375.

Bopyroides sarsi Bonnier, op. cit., pp. 376-377.

Bopyroides sp. Bonnier, op. cit., p. 378.

Bopyroides sp. Bonnier, op. cit., p. 378.

Bopyroides hippolytes Richardson, Proc. U. S. Nat. Mus., XXIII, 1901, p. 578; Proc. U. S. Nat. Mus., XXVII, 1904, pp. 64-65.

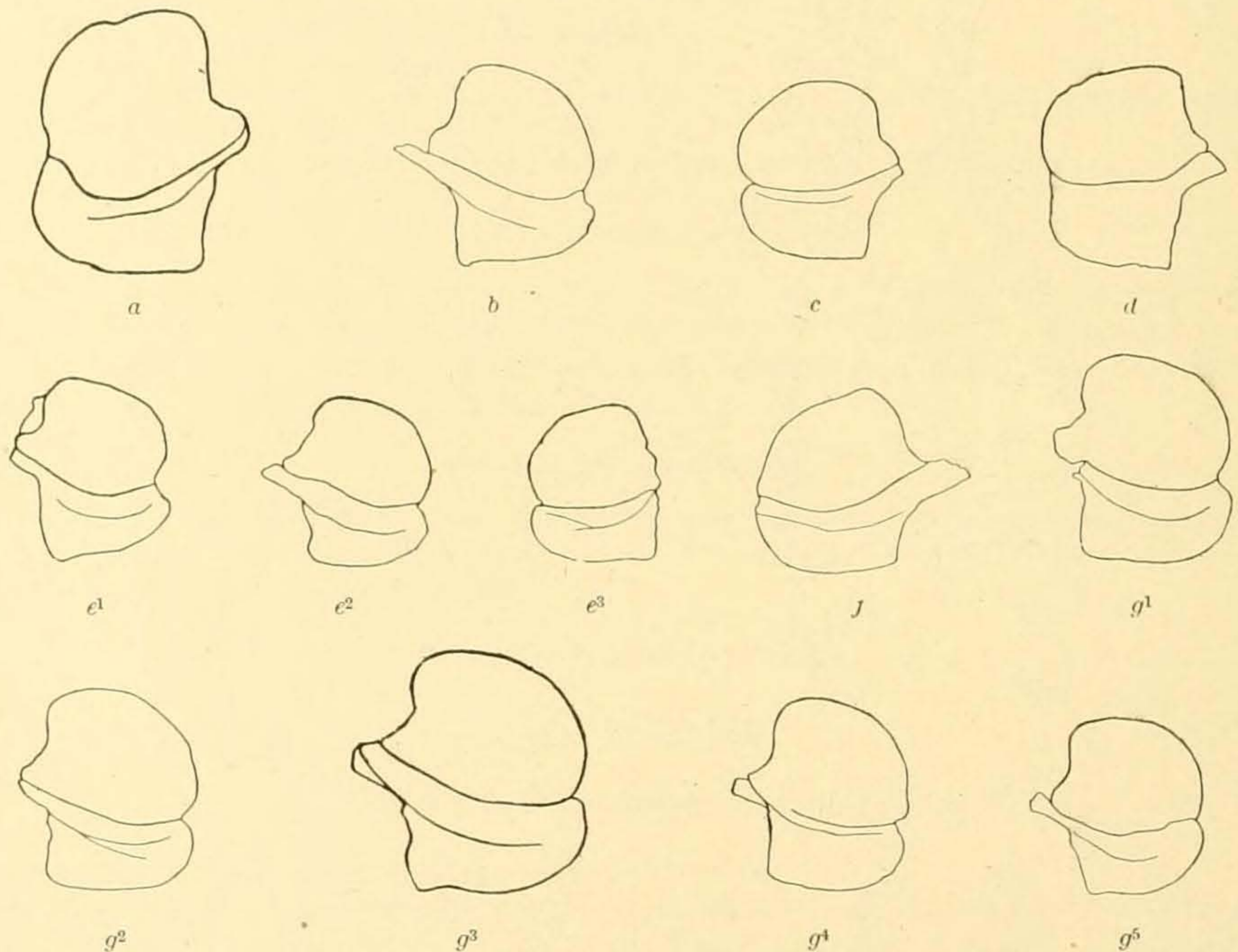


FIG. 6.—First incubatory lamella of *Bopyroides hippolytes*. a, Found on *Spirontocaris polaris* from west of Pribilof Islands; $\times 14\frac{1}{2}$. b, On *Spirontocaris suckleyi* from station 4222; $\times 5$. c, On *Spirontocaris suckleyi* from station 4268; $\times 11\frac{1}{2}$. d, On *Spirontocaris suckleyi* from station 4220; $\times 11\frac{1}{2}$. e*, On *Spirontocaris suckleyi* from station 4279. f, On *Spirontocaris herdmani* from station 4199; $\times 31$. g†, On *Pandalus jordani* from station 4203.

Localities.—Station 4192, Gulf of Georgia, off Nanaimo, Vancouver Island, British Columbia; station 4199, Queen Charlotte Sound, off Fort Rupert, Vancouver Island, British Columbia, on *Spirontocaris herdmani* Walker; station 4203, Queen Charlotte Sound, off Fort Rupert, Vancouver Island, British Columbia, on *Pandalus jordani* Rathbun; station 4220, Admiralty Inlet, vicinity of Port Townsend, on *Spirontocaris suckleyi* (Stimpson); station 4222, Admiralty Inlet, vicinity of Port Townsend, on *Spirontocaris suckleyi* (Stimpson); station 4268, Afognak Bay, Afognak Island, Central Alaska, on *Spirontocaris suckleyi* (Stimpson); station 4279, Alitak Bay, Kadiak Island, Central Alaska, on *Spirontocaris suckleyi* (Stimpson).

*From three different specimens found on the same species of host and from the same locality. Enlargement, e¹, $\times 7$; e², $\times 11\frac{1}{2}$; e³, $\times 7$.

†From five different specimens found on the same species of host and from the same locality. Enlargement, g¹, $\times 11\frac{1}{2}$; g², $\times 11\frac{1}{2}$; g³, $\times 14\frac{1}{2}$; g⁴, $\times 11\frac{1}{2}$; g⁵, $\times 11\frac{1}{2}$.

A number of drawings are presented of the first incubatory lamella and the sixth leg of *Bopyroides hippolytes* (Krøyer), from specimens found on the same and on different hosts, taken from the same and from different localities. The slight variations seen to exist in specimens coming from different hosts is paralleled by variations of a similar nature in specimens coming from the same host. If these

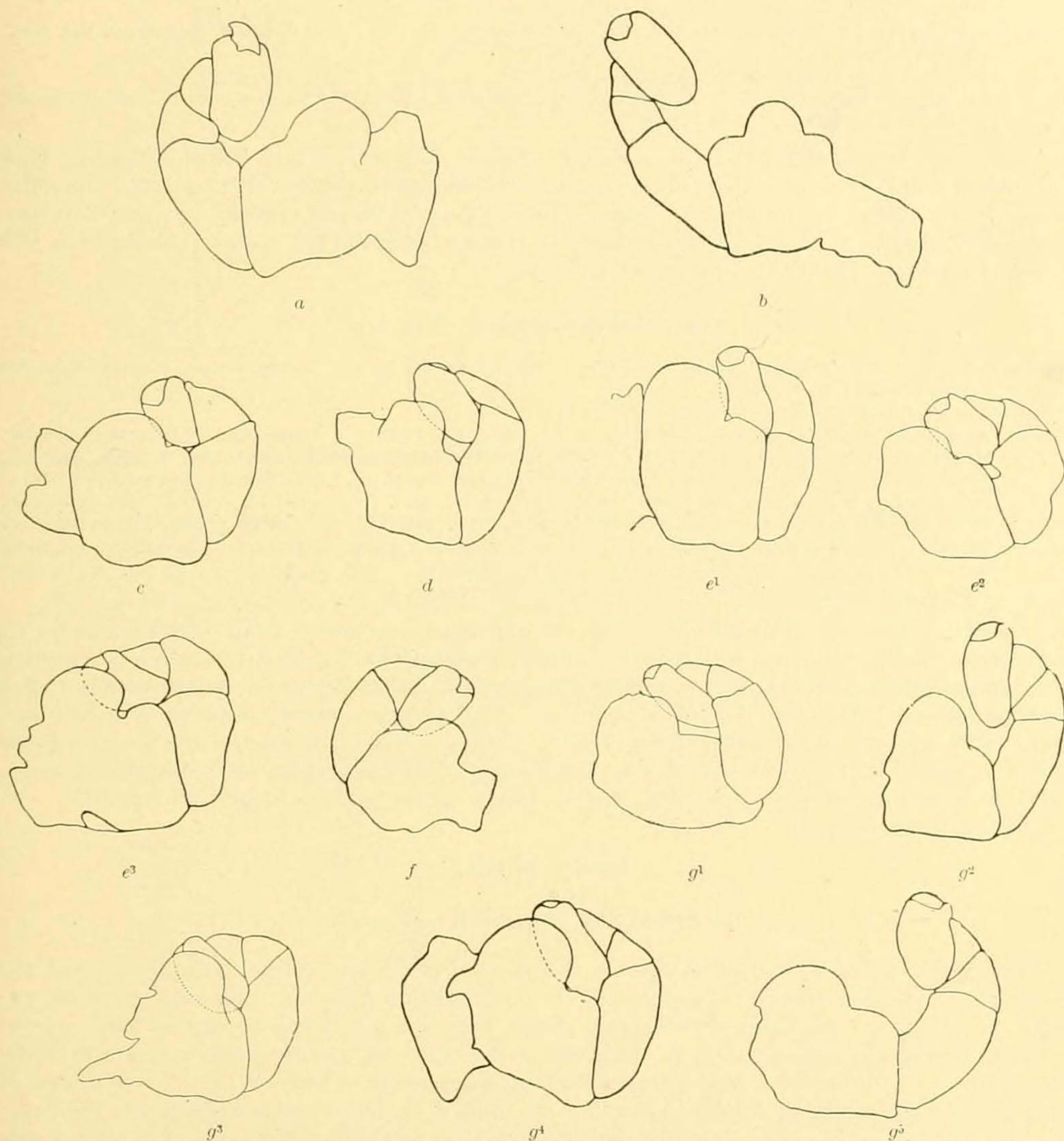


FIG. 7.—Sixth leg of *Bopyroides hippolytes*. *a*, Found on *Spirontocaris polaris** from west of Pribilof Islands; $\times 52$. *b*, On *Spirontocaris suckleyi* from station 4222; $\times 41$. *c*, On *Spirontocaris suckleyi* from station 4268; $\times 52$. *d*, On *Spirontocaris suckleyi* from station 4220; $\times 52$. *e* †, On *Spirontocaris suckleyi* from station 4279. *f*, On *Spirontocaris herdmani* from station 4199; $\times 77\frac{1}{2}$. *g* ‡, On *Pandatus jordani* from station 4203.

variations can not be considered as individual, more marked in this group of isopods than in any other, owing to the parasitic mode of life, there seems to be no other course possible than to make a new species of each individual. As these differences are slight, and as the general form of the parts is about the same, it would probably be better to consider them simply as variations or modifications.

*The parasite from *S. polaris* has distinct ovarian bosses on the first four segments of the thorax.

†See first note on page 218. Enlargement, *e*¹, $\times 39$; *e*², $\times 52$; *e*³, $\times 52$.

‡See second note on page 218. Enlargement, *g*¹, $\times 39$; *g*², $\times 52$; *g*³, $\times 39$; *g*⁴, $\times 41$; *g*⁵, $\times 52$.

I hope very soon to be able to extend this investigation to specimens of *Bopyroides hippolytes* from other hosts than those given here and to carry on the same studies with *Argeia pugettensis* and *Phryxus abdominalis*.

Argeia pugettensis Dana.

Argeia pugettensis Dana, U. S. Expl. Exp. XIV, 1853, Crust., II, p. 804, pl. LIII, fig 7. Stimpson, Bos. Journ. Nat. Hist., VI, 1857, p. 71.

Argeia sp.? Calman, Ann. N. Y. Acad. Sci., XI, No. 13, 1898, p. 281.

Argeia pugettensis Richardson, Proc. U. S. Nat. Museum, XXI, 1899, p. 868; XXVII, 1903, pp. 60-64; Proc. U. S. Nat. Museum, XXVII, 1904, pp. 60-64.

Localities.—Station 4192, Gulf of Georgia, off Nanaimo, Vancouver Island, British Columbia; Kili-sut Harbor, near Port Townsend, on *Crangon alaskensis* Lockington; stations 4220 and 4222, Admiralty Inlet, vicinity of Port Townsend, on *Crangon alaskensis* Lockington and *Crangon communis* Rathbun; station 4227, vicinity of Naha Bay, Behm Canal, Southeast Alaska, on *Crangon communis* Rathbun, and *Nectocrangon dentata* Rathbun; depth, 16-89 fathoms.

Phryxus abdominalis (Krøyer).

Bopyrus abdominalis Krøyer, Naturhistorisk Tidsskrift, II, 1840, pp. 102-289, pls. I, II; Monog. Fremst. Slægten Hippolytes nordiske Arter, 1842, p. 263.

Phryxus hippolytes Rathke, Fauna Norwegens, 1843, p., 40, pl. II, figs. 1-10.

Phryxus abdominalis Lilljeborg, Œfvers. Kongl. Vet.-Akad. Förh., IX, 1852, p. 11. Steenstrup and Lütken, Vidensk. Meddelelser, 1861, p. 275 (9). Bate and Westwood, Brit. Sessile-eyed Crust., II, 1868, p. 234. Norman, Rep. Brit. Assoc., 1869, p. 288; Proc. Royal Soc. Lon., XXV, 1876, p. 209. Buchholz, Zweite deutsche Nordpolfahrt, 1874, p. 287. Metzger, Nordseefahrt der Pomm., 1875, p. 286. Miers, Ann. Mag. Nat. Hist. (4), XX, 1877, p. 65 (15). Smith in Harger, Proc. U. S. Nat. Museum, II, 1879, p. 158. Harger, Rep. U. S. Fish Comm., 1880, pt. 6. (See Harger for synonymy and bibliography.) Axel Ohlin, Bidrag till Kannedomen om Malakostrakfaunan i Baffin Bay och Smith Sound, 1895, pp. 18-19. Sars, Crust. of Norway, II, 1899, pp. 215-217, pl. xc, xci. Richardson, Proc. U. S. Nat. Museum, XXIII, 1901, p. 577, and XXVII, 1904, pp. 58-59.

Localities.—Station 4192, Gulf of Georgia, off Nanaimo, Vancouver Island, British Columbia, on *Spirontocaris bispinosa* Holmes; station 4216, Admiralty Inlet, vicinity of Port Townsend, on *Spirontocaris tridens* Rathbun; station 4220, Admiralty Inlet, vicinity of Port Townsend, on *Spirontocaris tridens* Rathbun; station 4222, Admiralty Inlet, vicinity of Port Townsend, on *Spirontocaris tridens* Rathbun; station 4229, vicinity of Naha Bay, Behm Canal, Southeast Alaska, on *Spirontocaris macrophthalma* Rathbun; station 4230, vicinity of Naha Bay, Behm Canal, Southeast Alaska, on *Spirontocaris macrophthalma* Rathbun; station 4290, Uyak Bay, Kadiak Island, on *Spirontocaris suckleyi* (Stimpson).

Depth, 16-256 fathoms.

Family DAJIDÆ.

HOLOPHRYXUS Richardson, new genus.

This genus differs from *Dajus* Krøyer in the absence of all appendages to the abdomen of the female and in lacking all trace of segmentation. It differs from *Notophryxus* Sars and *Aspidophryxus* Sars^a, in having all five pairs of incubatory plates, only one pair being present in Sars' genera; in having no trace of segmentation, in the shape of the oral area, and the position and form of the abdomen, etc. It differs from *Heterophryxus* Sars^b in the position of the last pair of legs, which in *Heterophryxus* are rather anomalous in structure, are placed at the posterior extremity of the body, and are adapted for clasping. It differs from *Branchiophryxus* Caullery^c in having five pairs of legs and five pairs of incubatory plates, while in *Branchiophryxus* there are but four pairs of legs and four pairs of incubatory plates. It differs from *Zonophryxus* Richardson^d in lacking pleopoda, one pair being present in *Zonophryxus*, in the form of the abdomen, and in the general shape of the body. It differs from *Prodajus* Bonnier^e in the form of the abdomen, which is unsegmented and not bifurcate.

^aCrustacea of Norway, II, 1899, pp. 225-231. Norwegian North-Atlantic Expedition, Crust. I, 1885, pp. 136-139.

^bChallenger Report, XIII, 1885, Pt. XXXVII, Report on the Schizopoda, pp. 220-221, pl. XXXVIII, figs. 8-14.

^cJourn. R. Mier. Soc. Lond., 1897, pt. 3, p. 204. Zool. Anzeiger, XX, 1897, pp. 88-92.

^dU. S. Fish Comm. Report, 1903, pp. 51-52.

^eC. R. Acad. Sc. Paris, CXXXVI, 1903, pp. 102-103.

Holophryxus alaskensis Richardson, new species.

Body of female irregular in outline. Color uniformly light yellow. Head represented by a bilobed prominence, anterior to squarish body. Eyes wanting. Dorsal surface of thorax with no trace of segmentation; a few lines only are present, representing creases or folds in the integument and having

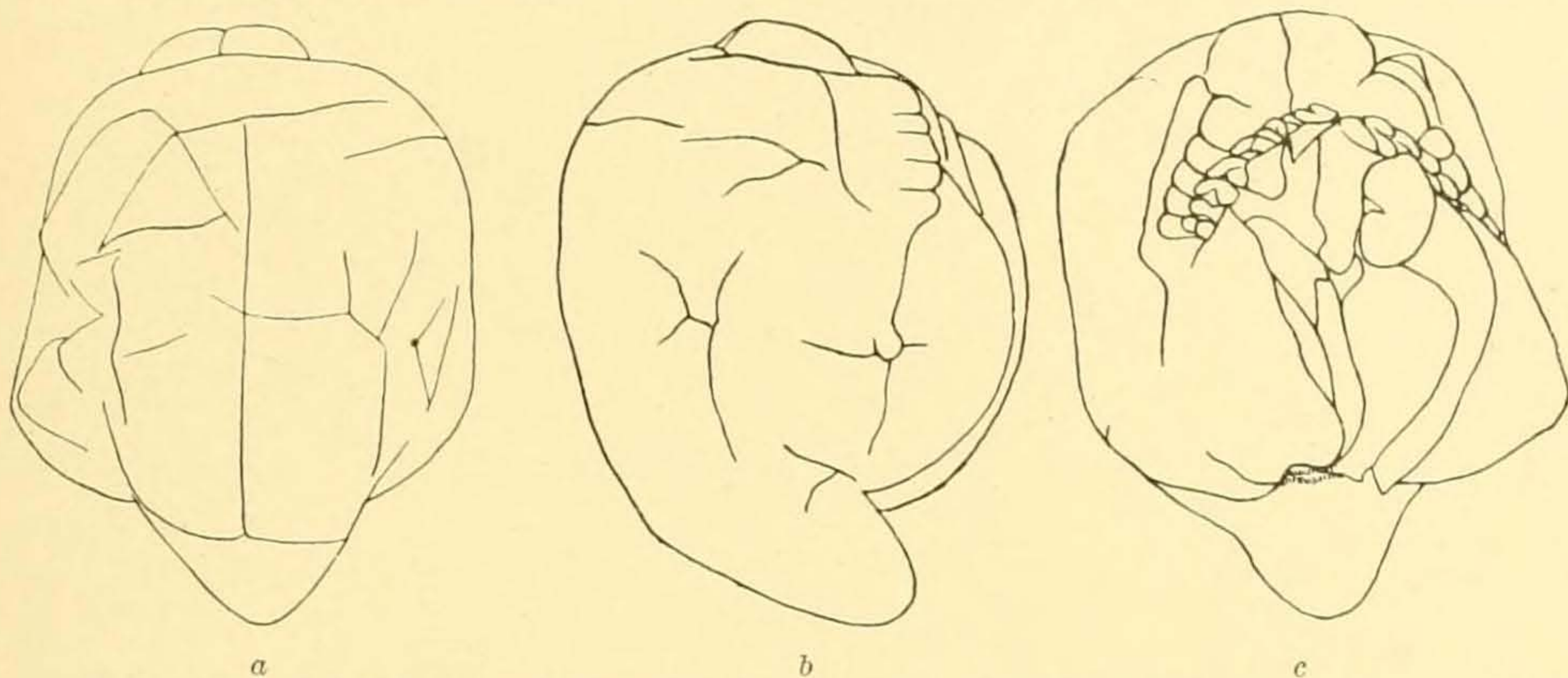


FIG. 8.—Adult female of *Holophryxus alaskensis* Richardson, new species. *a*, Dorsal view, $\times 4\frac{2}{3}$; *b*, lateral view, $\times 4\frac{2}{3}$; *c*, ventral view, $\times 4\frac{2}{3}$.

no relation to suture lines. The abdomen projects below the thorax—although there is no distinct boundary between these two divisions of the body—as a triangular process without any trace of segmentation and with no appendages. Uropoda and pleopoda are entirely wanting.

In a lateral view the first five segments of the thorax are represented by the five coxal plates, which bound the oral area, and are not separated by sutures from the dorsal surface of the body. On the ventral side the oral area is bounded anteriorly by the head and laterally by the two divergent rows of coxal plates. The antennæ and antennulæ are quite rudimentary. The antennæ seem to be composed of three joints, the antennulæ of two. There are five pairs of legs surrounding the oral area, situated just within the two rows of coxal plates. From the bases of these legs five pairs of incubatory plates arise, the last pair overlapping in the middle ventral line.

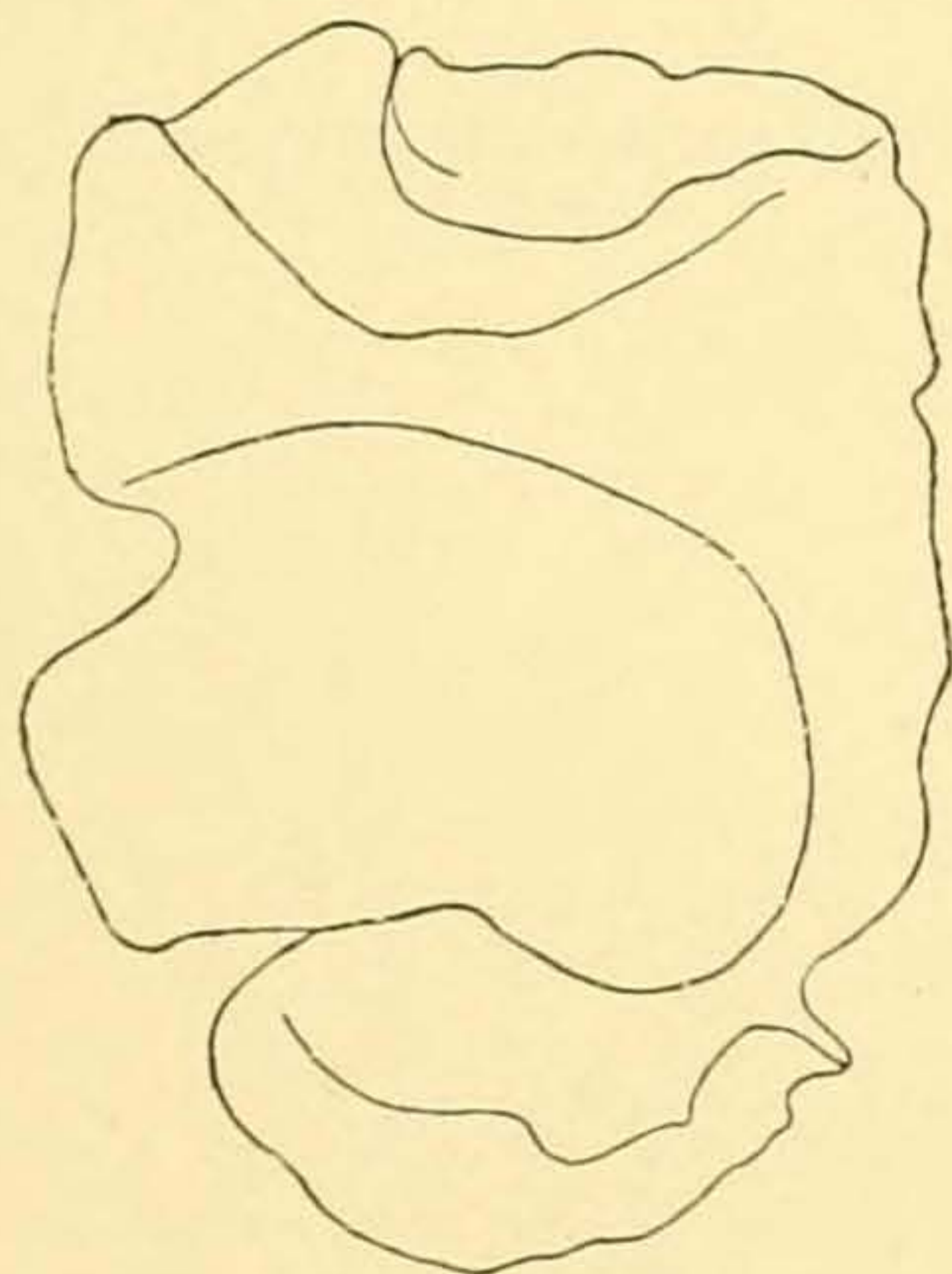


FIG. 9.—Maxilliped, *Holophryxus alaskensis*, $\times 41$.

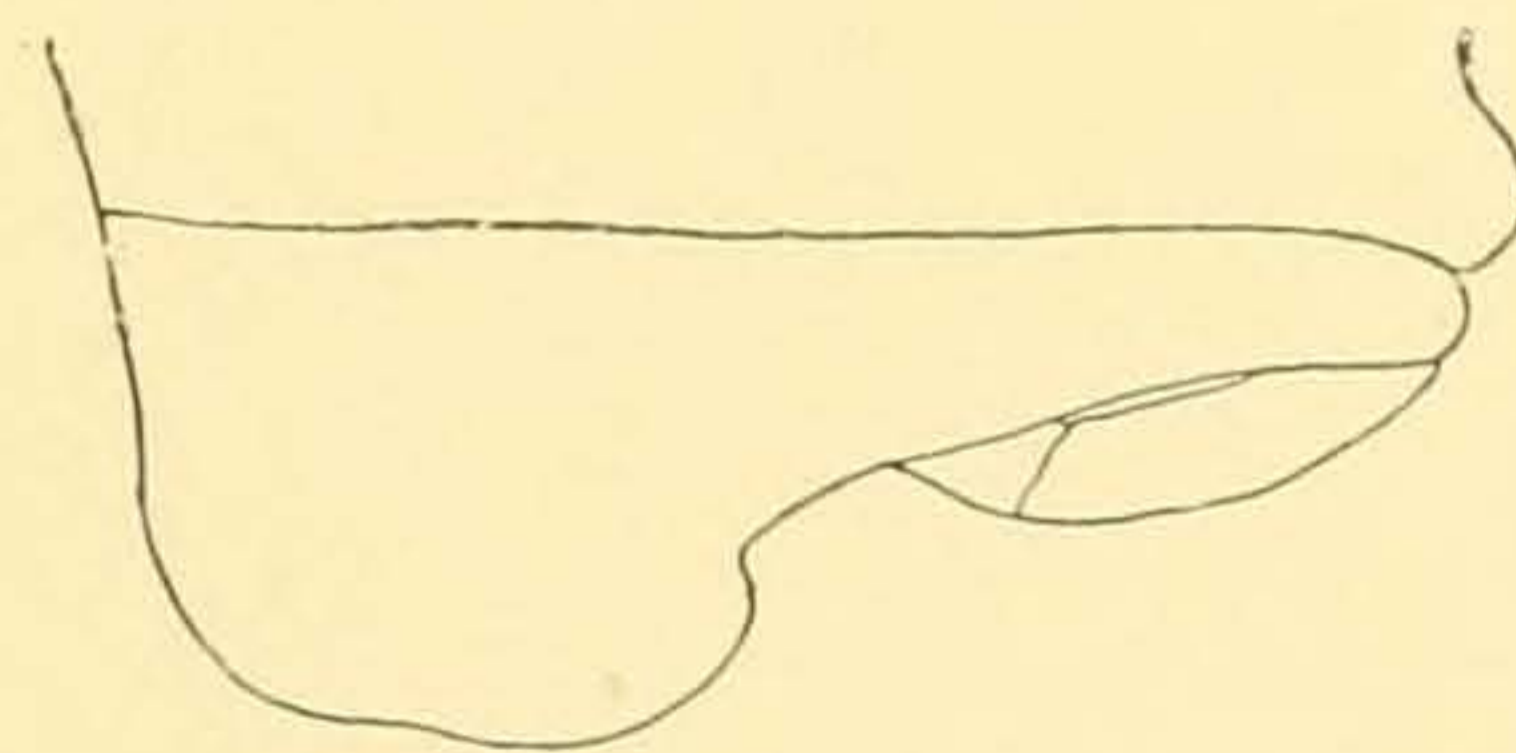


FIG. 10.—Terminal segment of first lamella of incubatory plates, *Holophryxus alaskensis*, $\times 41$.

No males were found. Three specimens were taken by the *Albatross* at station 4236, vicinity of Yes Bay, Behm Canal, and station 4257, vicinity of Funter Bay, Lynn Canal. Depth, 147–350 fathoms.

The host is unknown. The type of the species is in the United States National Museum, Cat. No. 29250.