

THE AMPHIPODA COLLECTED BY THE U. S. BUREAU
OF FISHERIES STEAMER "ALBATROSS" OFF THE
WEST COAST OF NORTH AMERICA, IN 1903 AND 1904,
WITH DESCRIPTIONS OF A NEW FAMILY AND SEV-
ERAL NEW GENERA AND SPECIES.

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The collection of Amphipoda which was obtained by the U. S. Bureau of Fisheries steamer, *Albatross* during its cruises off the northwest coast of North America during the Salmon Investigations of 1903 and off southern California in 1904, proved to be peculiarly rich in new species. The amphipod fauna of the Pacific Ocean, and especially that portion of it bordering the North American continent, is very imperfectly known. The species hitherto described have been mainly littoral forms, and as a large proportion of the Amphipoda obtained by the *Albatross* were dredged from considerable depths it is not surprising that the percentage of new species is high. Owing probably to the depth inhabited by many of the species quite a number were found to be devoid of eyes.

One of the striking features of the collection was the number of species of Ampelisca, most of which proved to be new. The Lysianasidæ were represented by seven species, all new; for four of these it was found necessary to institute new genera, one of which, *Valettiopsis*, is of interest on account of its primitive and transitional character. One species, *Stilipes distincta*, was so unique in its characteristics that a new family had to be created to receive it, and the two species of the new genus *Gracilipes* were perhaps sufficiently aberrant to be treated in the same way, but as the Calliopiidæ, by a little stretching, could be made to include them it was thought best to let them remain in that family.

Legion HYPERIIDÆ.

Family HYPERIIDÆ.

HYPERIA MEDUSARUM (Müller).

A single specimen from Station 4339, off Point Loma, California, 241-369 fathoms.

Family PHRONIMIDÆ.

PHRONIMA SEDENTARIA (Forskål).

Localities.—Station 4305, off Point Loma, 67-116 fathoms; 4322, off Point La Jolla, 110-199 fathoms; 4348, off Point Loma, 83-113 fathoms; 4382, off North Coronado Island, 642-666 fathoms; 4408 off Santa Catalina Island, 104-117 fathoms; 4488, Monterey Bay, 18-20 fathoms, and 4507, Monterey Bay, 308-347 fathoms.

Family TRYPHANIDÆ.

BRACHYSCELUS CRUSCULUM Bate.

A single specimen from Station 4356, off Point Loma, at a depth of 100 fathoms.

Family CYSTISOMIDÆ.

CYSTISOMA SPINOSUM (Fabricius).

A single specimen from Station 4528, Monterey Bay, 545-800 fathoms.

Family SCINIDÆ.

A single specimen of *Scina*, too imperfect to identify, was taken at Station 4405, off San Clemente Island, 654-704 fathoms.

Family VIBILIIDÆ.

VIBILIA CALIFORNICA, new species.

Rostrum short. Eyes rather large, oblong. First antennæ with flagellum longer than head. Second antennæ about equaling the first; flagellum 2-jointed. Segments of the body smooth. First gnathopods with the hand truncated distally, the infero-posterior angle only slightly projecting and armed with several acute serrations or teeth which are continued upon the distal half of the posterior margin; dactyl serrate on inner margin. Second gnathopods with the merus projecting below the carpus about as far as the hand and armed with several spines; carpus produced distally into a narrow triangular lobe extending beyond the tip of the hand and armed with several acute serrations; hand oblong, the distal margin nearly

transverse and armed like the posterior margin with acute serrations or teeth, which are especially prominent around the posterior angle. First peræopods rather stout, the dactyl a little over half the length

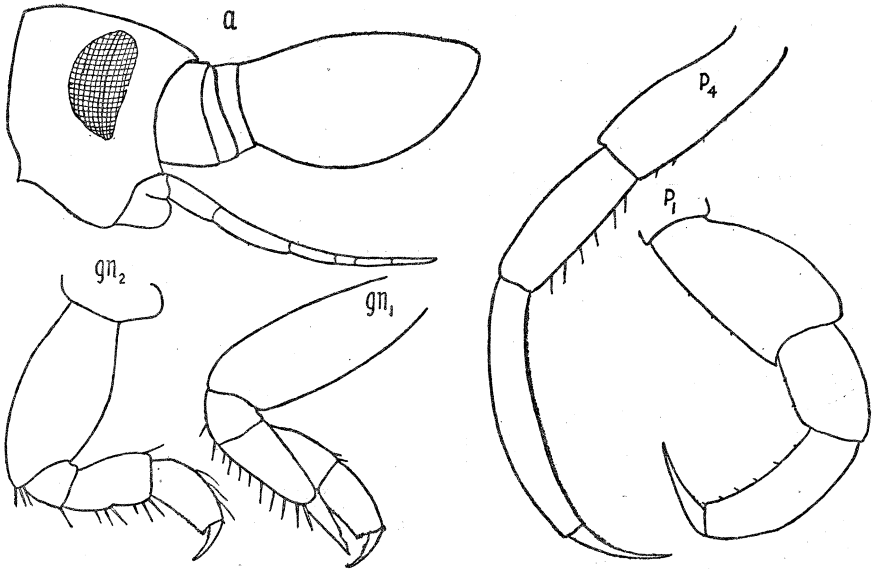


FIG. 1.—VIBILIA CALIFORNICA. *a*, HEAD AND ANTENNÆ; *gn*₁, FIRST GNATHOPOD; *gn*₂, SECOND GNATHOPOD; *p*₁, FIRST PERÆOPOD; *p*₄, FOURTH PERÆOPOD.

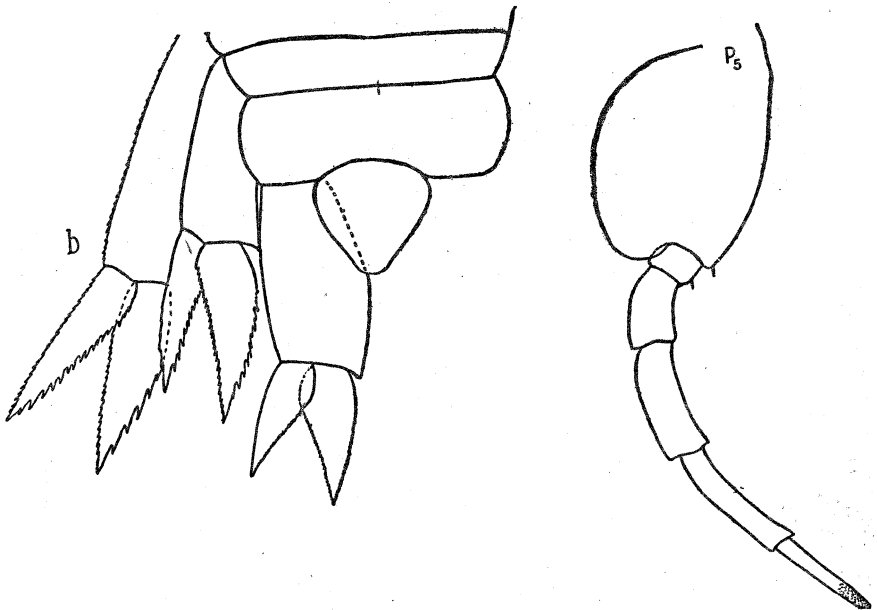


FIG. 2.—VIBILIA CALIFORNICA. *b*, UROPODS AND TELSON; *p*₅, FIFTH PERÆOPOD.

of the preceding joint. Fourth peræopods about a third larger than the first, the carpus armed with six or seven spines; propodus a half

longer than the carpus; anterior margin regularly pectinated with short spines; dactyl a third the length of the carpus, inner margin with several short spines. Fifth peraeopods about two-thirds the fourth; last joint straight, rounded at tip and about four-fifths the length of the preceding one.

Posterior angles of the last abdominal segment not produced. Peduncles of uropods larger than rami although but slightly larger than the inner ramus in the second pair. Peduncle of first pair with outer margin serrate; margins of the other pairs smooth. Inner rami slightly longer than the outer or equal in first pair, the margins serrate except the outer margin of the outer ramus of the last pair; outer margin of outer ramus of second pair smooth on basal half but with small serrations distally. Telson broadly ovate, distally rounded and about reaching middle of peduncle of last uropods.

Length.—9 mm.

Locality.—Station 4305, 2 specimens, off Point Loma, 67–116 fathoms.

Type.—Cat. No. 38533, U.S.N.M.

Legion GAMMARIDEA.

Family LYSIANASSIDÆ.

ORCHOMENELLA AFFINIS, new species.

Eyes large, with numerous facets, widened below and light brownish in alcohol. Lateral lobes of the head broadly rounded. First antennæ not longer than the head and first thoracic segment. Second antennæ are twice the length of the first. Epistome somewhat projecting. First gnathopods unusually stout, the carpus with a narrow posterior lobe, closely fitting over base of hand; the latter nearly rectangular, slightly widened at base, palm transverse, slightly curved, finely dentate, and armed with two stout spines at the end between which the finger closes. Second gnathopods with the hand narrower than the carpus and about half as long, and having the infero-posterior angle produced so as to be almost chelate. Third abdominal segment with the infero-lateral angle rounded and the posterior margin above this smooth. Fourth segment with a rounded sinus above, behind which is a rounded elevation. Terminal uropods with the inner ramus shorter than the basal segment of the outer and furnished with plumose setæ on the inner and three spines on the outer margin; outer ramus with plumose setæ and a few spines on inner margin, the outer margin armed with about eight short spines. Telson cleft nearly to the base, the lobes diverging distally, the tip with a spine on either side; lateral margins with three or four spines.

Length.—13 mm.

Locality.—Three specimens from Station 4508, Monterey Bay, 292–356 fathoms.

Type.—Cat. No. 38534, U.S.N.M.

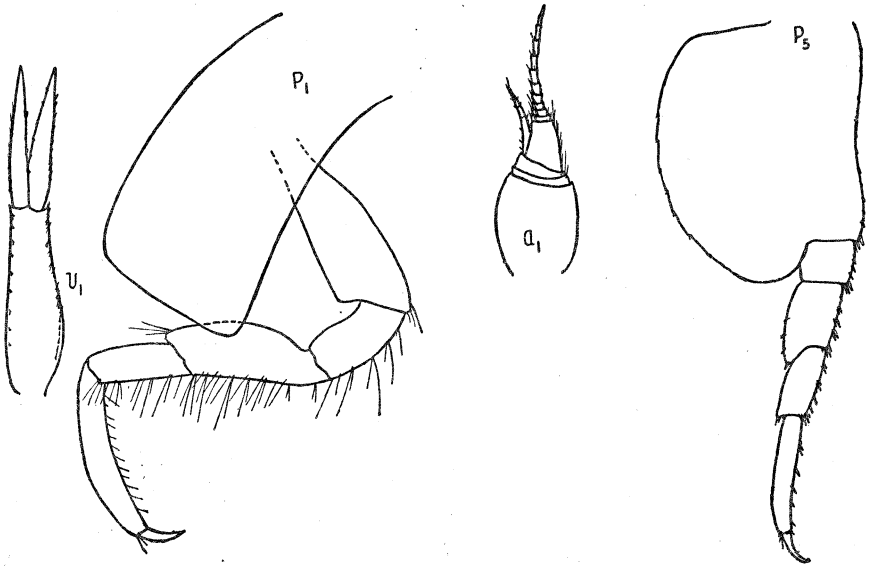


FIG. 3.—ORCHOMENELLA AFFINIS. a_1 , FIRST ANTENNA; p_1 , FIRST PERÆOPOD; p_5 , FIFTH PERÆOPOD; u_1 , FIRST UROPOD.

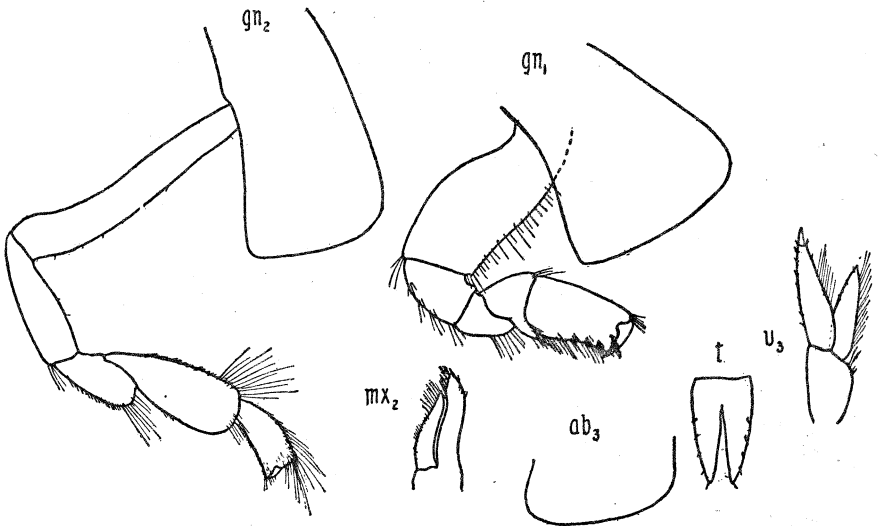


FIG. 4.—ORCHOMENELLA AFFINIS. ab_3 , THIRD SEGMENT OF THE ABDOMEN; gn_1 , FIRST GNATHOPOD; gn_2 , SECOND GNATHOPOD; mx_2 , SECOND MAXILLA; t , TELSON; u_3 , THIRD UROPOD.

This species is closely allied to *O. nanus* (Krøyer), but differs in having considerably stouter first gnathopods with a much narrower posterior lobe on the carpus; the hand of the second gnathopods is

curved backward and more strongly produced at the distal end. From *O. grænlandica* (Hensen) it differs in the same features as well as in having the infero-lateral angles of the third abdominal segment rounded instead of acute. It resembles *O. pinguis* (Boeck), but has the lateral angles of the head much more broadly rounded, the merus of the third peræopods less widely expanded, the margin above the lower angle of the third abdominal segment smooth instead of finely crenulated, and the lobes of the telson more diverging. It has much larger eyes than *O. minuta* (Krøyer) and quite different first gnathopods.

Genus VALETTIOPSIS,^a new.

First antennæ well developed with basal joint only moderately enlarged and flagellum elongate. Mandibles with dentate cutting edge,

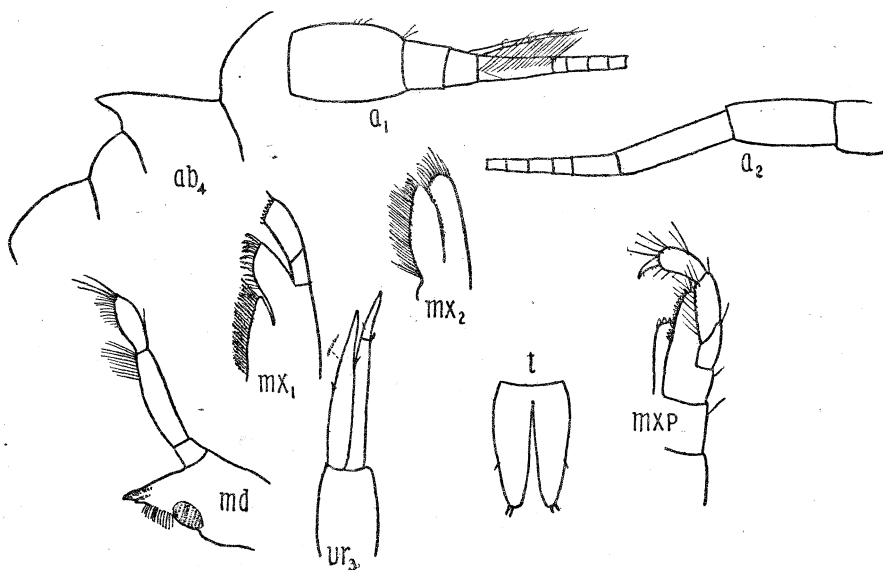


FIG. 5.—VALETTIOPSIS DENTATUS. *a*₁, FIRST ANTENNA; *a*₂, SECOND ANTENNA; *ab*₄, FOURTH SEGMENT OF THE ABDOMEN; *md*, MANDIBLE; *mx*₁, FIRST MAXILLA; *mx*₂, SECOND MAXILLA; *msp*, MAXILLIPED; *t*, TELSON; *ur*₃, THIRD UROPOD.

secondary plate, spine row, and a well-developed palp opposite the molar tubercle. First maxillæ with the inner plate furnished with numerous plumose setæ along the inner margin; outer plate with the distal margin oblique and armed with denticulate spines; palp two-jointed and armed with short spinules on distal margin. Second maxillæ with subequal lobes, the inner setose along inner margin as well as tip. Maxillipeds with well-developed inner plates; outer plates armed with spines on inner margin, not reaching penul-

^a From *Valettia*, a genus of Amphipods, and *δψis*, appearance.

imate joint of palp. First gnathopod with subchelate hand; second gnathopods with well-developed subchelate hand, having the finger articulating at the antero-inferior angle. Gills simple. Uropods with narrow rami. Telson deeply cleft.

Type of the genus—*V. dentatus*, new species.

This genus is remarkable among the Lysianassidæ in having the cutting edge of the mandible dentate. The first antennæ are more like the usual type, the first joint of the peduncle being only moderately enlarged, and the second and third being longer than in most other members of this family. The hand of the second gnathopods approaches the typical form, although possessing lysianassid features. The genus is apparently a primitive and transitional one.

VALETTIOPSIS DENTATUS, new species.

Eyes absent. Lateral lobes of head narrowly rounded. First antennæ about half the length of the body, the peduncle with the first

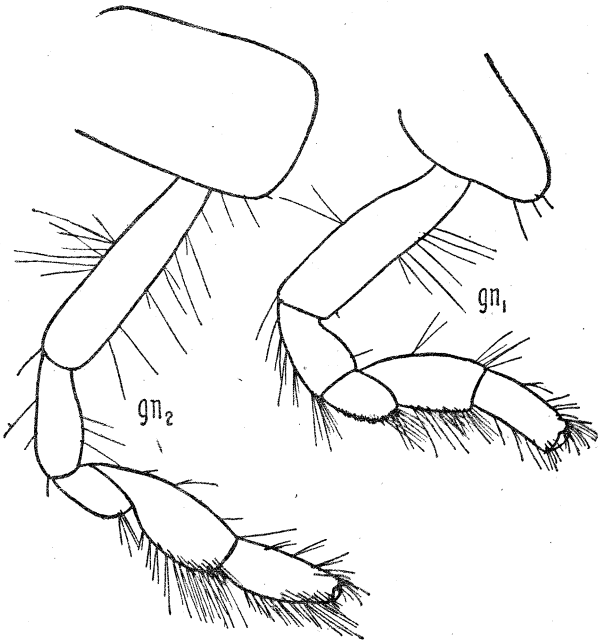


FIG. 6.—VALETTIOPSIS DENTATUS. gn_1 , FIRST GNATHOPOD; gn_2 , SECOND GNATHOPOD.

joint about twice as long as thick and a little larger than the next two; secondary flagellum four-jointed and extending beyond the elongate first joint of the primary one. Second antennæ about the length of the first, the last joint of the peduncle a little longer than the preceding one. Mandibles with both primary and secondary cutting edge dentate; molar tubercle broad with its face roughened; last joint of palp half length of preceding. Outer plate of first maxilla with ten

denticulate spines at distal end; palp with eight short spines on distal margin, the inner and the outer one more slender than the others. Inner plate of maxillipeds with three short stout spines at distal end; outer plate with about twelve stout spines on inner margin. First gnathopods with nearly rectangular hand; palm transverse. Second gnathopods with the hand elongate, somewhat narrowed distally; palm short, transverse. Infero-lateral angle of third abdominal segment acute. Fourth segment with a large dorsal, backwardly directed tooth. Uropods with narrow rami, those of the third pair minutely pectinate along one side and armed with two or three spines each. Telson cleft nearly to the base, armed with a pair of small spines at the tip of each lobe and a spine on either side near the outer margin.

Length.—6 mm.

Locality.—A single specimen from Station 4399, off San Diego, California, 245–285 fathoms.

Type.—Cat. No. 38535, U.S.N.M.

TRYPHOSA CÆCA, new species.

Eyes absent, or at least not visible in preserved material. Lateral angles of the head projecting and acute. First antennæ about as long

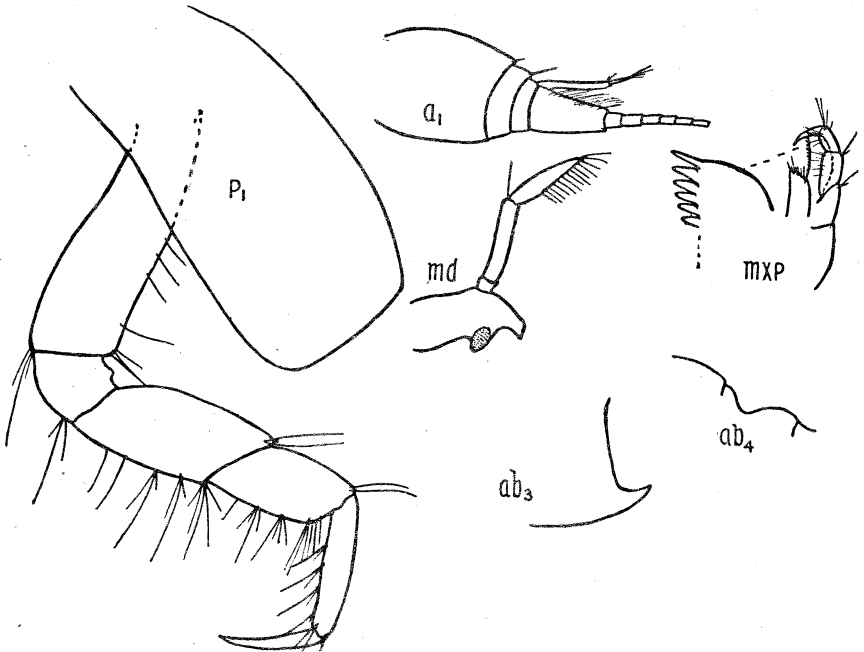


FIG. 7.—TRYPHOSA CÆCA. a_1 , FIRST ANTENNA; ab_3 , THIRD SEGMENT OF THE ABDOMEN; ab_4 , FOURTH SEGMENT OF THE ABDOMEN; md , MANDIBLE; mxp , MAXILLIPED; p_1 , FIRST PEREPOD.

as the head and two following segments, the first joint twice longer than the next two. Second antennæ fully twice the length of the

first, with the last joint of the peduncle slightly longer than the preceding one. Maxillipeds with the outer plate furnished with about thirteen stout spines on inner margin; inner plate armed on oblique distal margin with three short stout spines; penultimate joint of palp reaching but little beyond outer plate. First gnathopods with the hand slightly shorter than the carpus, slightly widened distally, the palm oblique and armed at posterior angle with three spines. Second gnathopods with the hand scarcely half as long as the carpus, oblong in outline; finger articulated at middle of transverse distal margin. Infero-lateral angle of the third abdominal segment produced and acute. Fourth segment with a sinus above followed by a

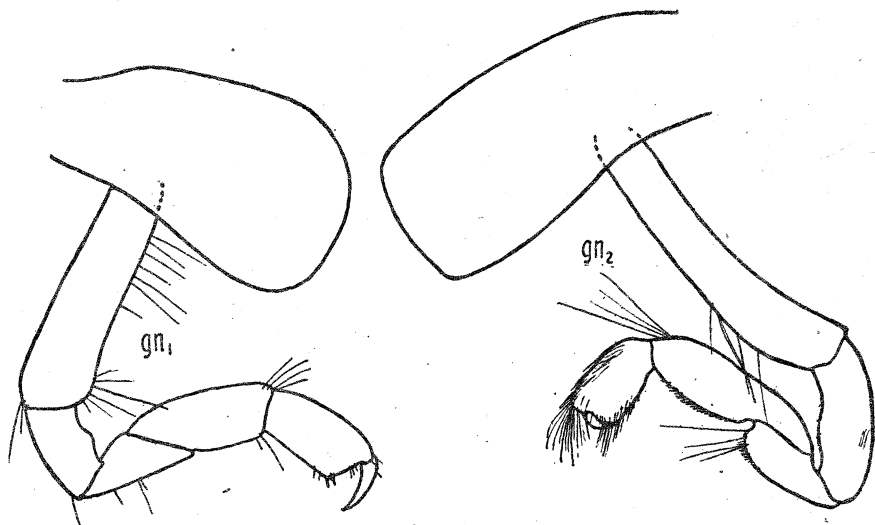


FIG. 8.—TRYPHOSA COECA. gn_1 , FIRST GNATHOPOD; gn_2 , SECOND GNATHOPOD.

rounded elevation. First uropods with the rami nearly equal and slightly longer than the peduncle. Rami of second pair equal, armed with few spines, and not extending so far back as those of the first or third pairs. Third uropods with the rami equal, nearly twice the length of the peduncle, the terminal segment of the outer ramus about half the length of the basal one. Telson cleft to near the base, the cleft widening into a triangular form distally; tip of telson armed with a spine on either side and reaching the basal third of the rami of the third uropods.

Length.—8 mm.

Locality.—A single female specimen from Station 4549, Monterey Bay; 56–57 fathoms.

Type.—Cat. No. 38536, U.S.N.M.

Genus LAKOTA,^a new.

Lateral angles of head prominent, antennæ of the usual form. Epistome not prominent. Upper lip projecting as a prominent rounded lamina far beyond the epistome. Mandible with well developed palp situated opposite the rather small pointed molar, which is nearer the distal than the proximal end. First maxillæ with the blunt end of the inner plate furnished with two plumose setæ; outer plate oblique distally where it is furnished with several spine teeth; palp two-jointed, the distal end widened and furnished with several teeth. Second maxillæ with the lobes rather broadly oblong, setose on the tip and inner margin; inner plate shorter than the outer. Maxillipeds with the inner plates short and broad; outer plates not extending beyond the second joint of the palp, the margin devoid of spines but furnished with small nodular denticles. Side plates deep. First gnathopods subchelate; carpus rather long; hand about as wide as carpus with a nearly transverse palm. Second gnathopods with the hand rather narrow, and not produced at the lower angle. Last two peræopods rather slender, of nearly equal length, with broad basal joints. Branchiæ simple. Infero-posterior angle of third abdominal segment produced. Terminal uropods projecting beyond the others, the rami subequal, flattened, lanceolate, furnished with lateral spines and setæ. Telson oblong, deeply cleft.

Type of the genus.—*L. carinata*, new species.

This genus is allied to *Tryphosa*, but differs in that the epistome is not projecting, and in having shorter inner and outer plates in the maxillipeds. From *Chironesimus*, which it resembles, among other things, in the character of the upper lip it differs in having a narrower hand in the second gnathopods which is not widened distally, and in having the carpus in the first gnathopods no wider than the hand.

LAKOTA CARINATA, new species.

Eyes oblong, light brownish in alcohol. Anterior angle of head acute, about reaching the tip of the first joint of the first antennæ. First antennæ short, the secondary flagellum with four joints, of which the first is elongate. Second antennæ about a third the length of the body. Outer plate of first maxillæ with about ten spine teeth and a tuft of setæ at the inner end of the oblique distal margin; apical margin of palp with about eight short teeth. Inner plate of maxillipeds with several plumose setæ in inner margin; outer plate with few setæ.

First gnathopods with the side plates somewhat widened distally, hand as wide and nearly as long as the carpus, subrectangular, the

^a No etymology.

nearly transverse palm with spines at the posterior angle. Hand of second gnathopods over half as long as the carpus, nearly rectangular; palm nearly transverse. Merus of first two peræopods wide and produced at the lower anterior angle; carpus about two-thirds as long as the propodus, which is nearly as long as the merus; dactyl about half as long as the preceding joint. Merus of third peræopods expanded, that of the fourth pair less so; while in the last pair the merus is scarcely wider than the carpus; dactyl about half the length of the propodus in the third pair and about one-third the length of the propodus in the last pair. Fifth pair of coxal plates a little broader than deep. Third abdominal segment with the infero-posterior angle produced into a rather short triangular tooth. Fourth segment with a dorsal sinus near the anterior end behind which is a

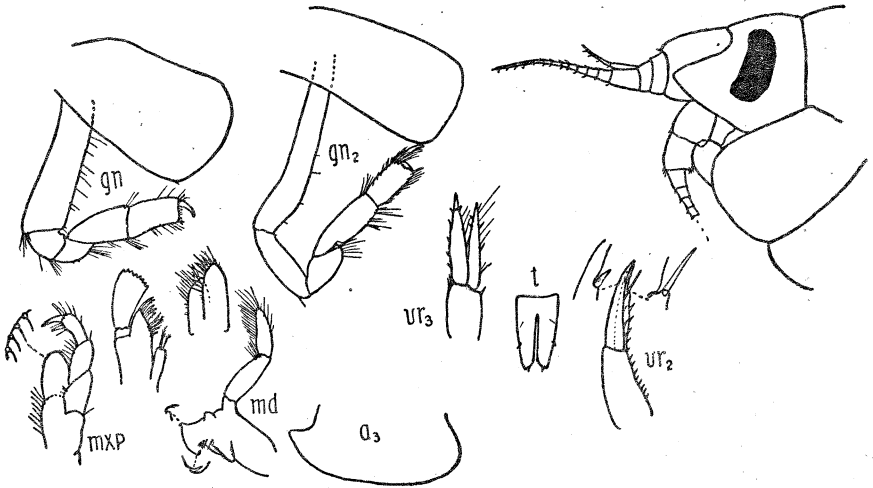


FIG. 9.—LAKOTA CARINATA. *a*₃, THIRD ABDOMINAL SEGMENT; *gn*₁, FIRST GNATHOPOD; *gn*₂, SECOND GNATHOPOD; *md*, MANDIBLE; *m**x**p*, MAXILLIPED; *t*, TELSON; *ur*₂, SECOND UROPOD; *ur*₃, THIRD UROPOD.

gently arched carina. First uropods extending beyond the second but not the third pair; rami equal, about two-thirds as long as the peduncle, lanceolate, and armed with several spines. Rami of second peræopods about as long as the peduncle, armed with several spines, inner ramus slightly shorter than the outer with a constriction or incision at the posterior third, just in front of which is a prominence bearing a large spine; a smaller constriction beyond the last spine on the outer ramus. Third uropods with the inner ramus slightly shorter than the outer, but reaching beyond the first joint; terminal joint of outer ramus narrowly conical, inner margins of both rami with plumose setæ; inner ramus with three spines on the inner and two on the outer margin; outer ramus with five spines or pairs of spines on the outer margin and none on the inner, except at the end of the first joint.

Telson with a short spine and a small seta at the end of each lobe and a single dorsal spine on either side.

Length.—10 mm.

Locality.—A single specimen from Station 4342, off South Coronado Island, 53–66 fathoms.

Type.—Cat. No. 38537, U.S.N.M.

SCOPELOCHEIRUS CECUS, new species.

Blind. Lateral corners of the head produced into a large acute lobe. Antennæ short; the first shorter than the second, the first joint very tumid, as thick as long; first joint of the flagellum a little longer than the five or six others combined; accessory flagellum a little longer than the first joint of the primary one, the elongate first joint followed by two small terminal ones. Second antennæ with the flagellum scarcely as long as the peduncle. A sinus between the

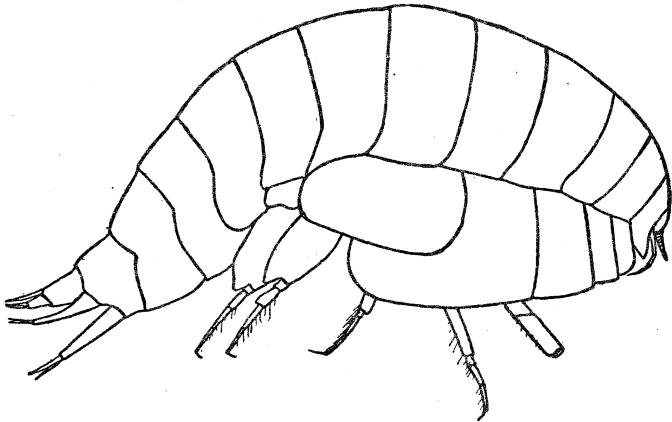


FIG. 10.—SCOPELOCHEIRUS CECUS.

epistome and the projecting upper lip. Mandibles with an elongated acute molar tubercle at the level of the palp. First maxillæ with the tapering inner plate nearly reaching tip of outer and furnished with twenty to twenty-five plumose setæ on inner margin; palp with seven spines on distal margins, the outer one single-pointed and finely setose, the others not setose, bifid, with the inner tooth situated farther down on the side as one passes toward the inner end of the row. Second maxillæ with inner plate nearly as long as outer. Outer plate of maxillipeds not quite reaching end of second joint of palp.

First gnathopods with the hand narrow, tapering, shorter than carpus; the small finger pointing toward proximal end of hand, furnished with dense rows of setæ on outer margin; a dense tuft of setæ on tip of hand behind dactyl. Second gnathopods with the

carpus wider than the hand and nearly twice as long; hand with the

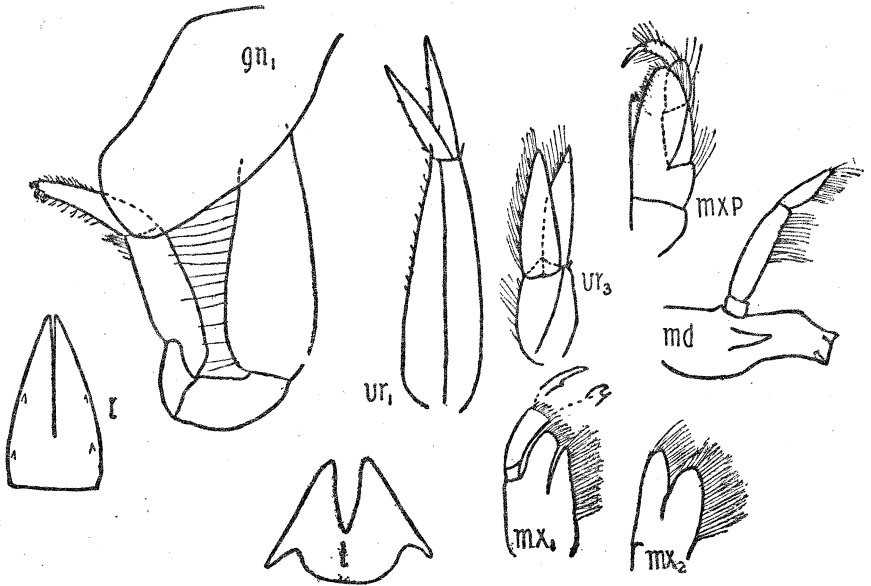


FIG. 11.—SCOPELOCHEIRUS CÆCUS. *gn*₁, FIRST GNATHOPOD; *l*, LOWER LIP; *md*, MANDIBLE; *mx*₁, FIRST MAXILLA; *mx*₂, SECOND MAXILLA; *mXP*, MAXILLIPED; *t*, TELSON; *ur*₁, FIRST UROPOD; *ur*₃, THIRD UROPOD.

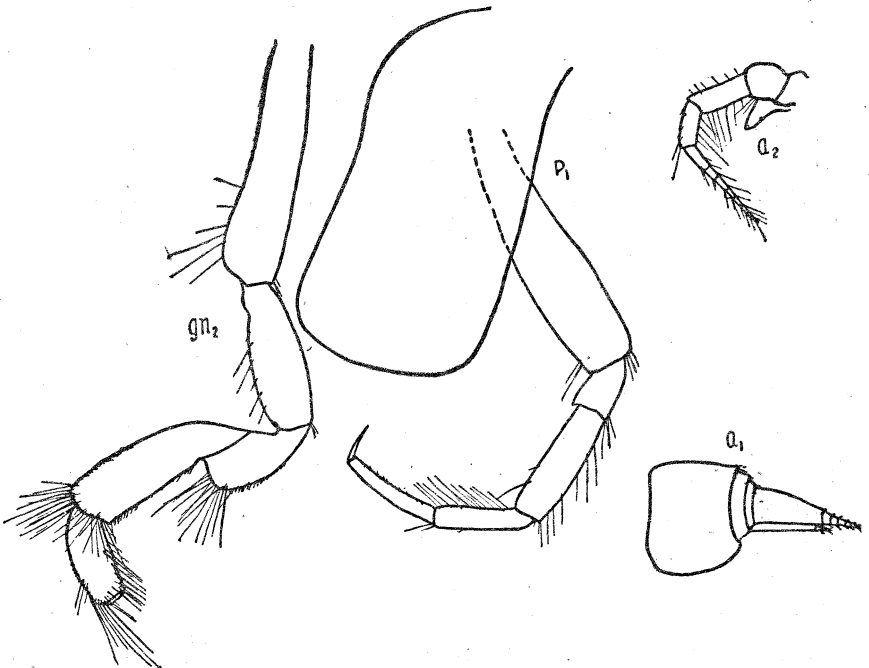


FIG. 12.—SCOPELOCHEIRUS CÆCUS. *a*₁, FIRST ANTENNA; *a*₂, SECOND ANTENNA; *gn*₂, SECOND GNATHOPOD; *p*₁, FIRST PEREPOD.

palm nearly transverse. Last three peræopods with the large basal

joints strongly produced downward at the posterior angle; tarsi about a third the preceding joint.

Rami of third uropods longer than peduncle, the inner nearly as long as outer and furnished with several spines and setæ on inner margin. Telson tapering to a narrow tip, with two dorsal pairs of spines, but no terminal ones.

Length.—20 mm.

Locality.—A single female specimen, Station 4405, off San Clemente Island, 654–704 fathoms.

Type.—Cat. No. 38538, U.S.N.M.

This species is larger than the two others assigned to this genus, of which the larger reaches a length of 9.5 mm. It is distinguished by being blind; or at least no trace of eyes could be discovered in the specimen examined, which was preserved in alcohol. The fourth abdominal segment is not indented above as in the other species of the genus; the outer plate of the maxillipeds is longer, the antennæ, especially the second pair, are shorter, and the telson more pointed and devoid of apical spines.

Genus KOROGA,^a new.

Epistome not very prominent. Upper lip projecting and clearly defined from the epistome by an incision. Antennæ short. Mandible with molar small; palp behind molar, the terminal joint narrow and shorter than the preceding. Lower lip and first and second maxillæ as in *Onisimus*. Maxillipeds with the outer plate extending beyond the second joint of the palp, furnished with low teeth, but no spines except one or more small ones at the apex; last joint of palp unguiform. Side plates deep, the anterior pair produced forward below. First gnathopods stout; the carpus very short; hand short and broad, but much longer than the carpus, subchelate with clearly defined palm. Second gnathopods with the hand oblong, narrower than the somewhat expanded carpus and not half as long, somewhat produced at the infero-posterior angle; the minute dactyl articulated behind the middle of the distal margin. Gills simple. Last three pairs of pereopods of nearly equal length with the basal joints expanded. Infero-posterior angle of the third abdominal segment not strongly produced. Terminal uropods with flattened lanceolate rami, the outer ramus with a short second joint. Telson not deeply cleft.

Type of genus.—*K. megalops*, new species.

This genus is closely allied to *Onisimus* and *Pseudalibrotus*. From both of these it differs in having a less developed molar on the mandible, in having the outer plate of the maxillipeds extend beyond the second joint of the palp, in having stouter first gnathopods with rela-

^a No etymology.

tively much shorter carpus. It differs from *Onisimus* also in not having the infero-posterior angle of the third abdominal segment produced into an acute tooth, and from *Pseudalibrotus* in its shorter antennæ, in the position of the mandibular palp, and in having the upper lip clearly defined from the epistome. From *Lysianassa*, which it resembles, it differs in having two setæ on the inner plate of the first maxillæ, in having simple gills, and in having the first gnathopods subchelate. From *Aruga* it differs in the last named character and in the simple gills. From *Lysianopsis* it differs in the subchelate gnathopods and the terminal uropods.

KOROGA MEGALOPS, new species.

Lateral lobes of head broadly rounded. Eyes very large, elongated, nearly meeting above. First antennæ with the flagellum about as long as the peduncle and composed of one elongated joint and about seven others; secondary flagellum about two-thirds as long as the primary and composed of four joints. Second antennæ with the last basal joint a little shorter than the preceding one; flagellum shorter than the peduncle and composed of about twelve joints.

Epistome carinate in front, very slightly convex. Lower lip evenly rounded in front. Mandibles with the molar low, more or less pointed behind and covered with short setæ. Distal margin of second expanded joint of the palp of the first maxillæ furnished with seven spine-teeth external to which are a few small serrations. Inner plates of maxillipeds narrow, distally truncated, furnished with plumose setæ on inner side; outer plate with about fourteen small denticulations and two very small spines on distal margin.

First gnathopods with the very short carpus furnished with a narrow posterior lobe closely applied to the base of the hand; hand quadrate, nearly as broad as long; palm transverse, about as long as the slightly concave posterior margin and armed with a spine at the end, evenly and gently convex and cut into several minute, sharp, irregular serrations. Second gnathopods with the lower posterior part of the elongated and distally widened carpus bulging and scabrous; hand twice as long as wide, slightly widening distally. First and second peræopods with the merus widened and produced at the antero-distal angle.

Infero-posterior angle of the third abdominal segment a right angle. The posterior extremity of the dorsal side of this segment curves abruptly downward and overhangs a dorsal depression on the fourth segment, which is followed by an elevation ending abruptly near the posterior margin. Third uropods extending farther back than the others, the rami a little longer than the peduncle, the outer ramus somewhat the longer. Telson tapering to a notched extremity

with a minute spine and seta on either side of the sallow emargination.

Length.—10 mm.

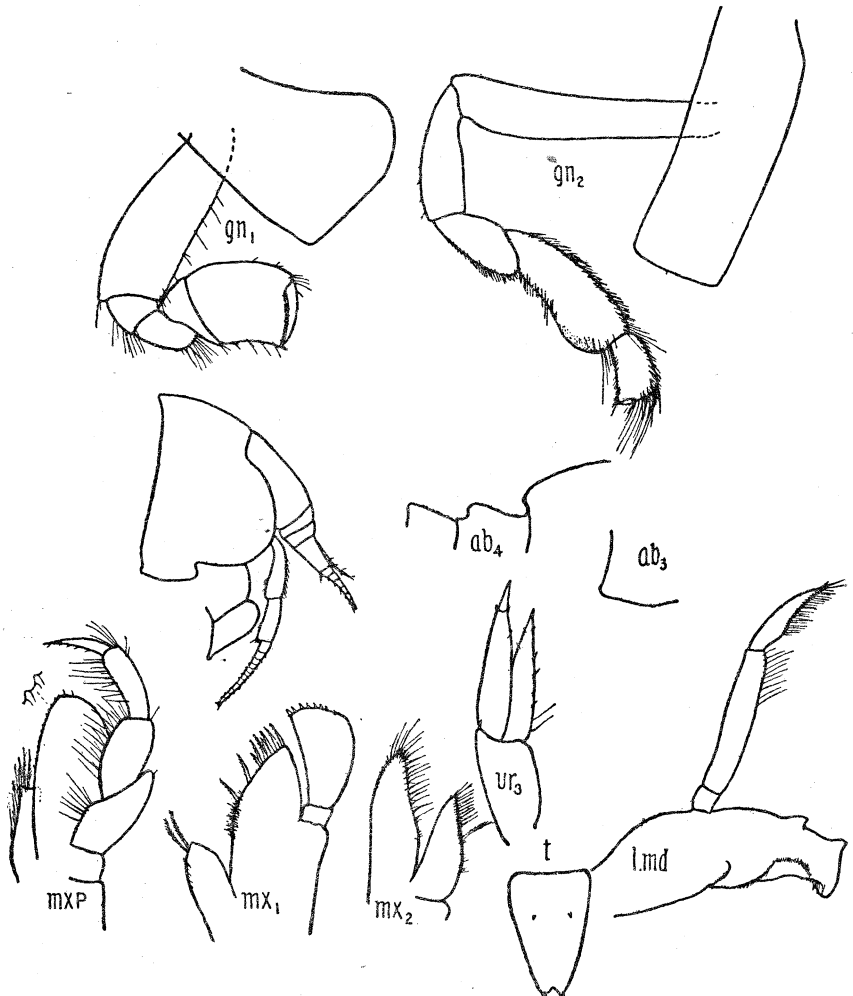


FIG. 13.—KOROGA MEGALOPS. *ab*₃, THIRD SEGMENT OF THE ABDOMEN; *ab*₄, FOURTH SEGMENT OF THE ABDOMEN; *l.md*, LEFT MANDIBLE; *gn*₁, FIRST GNATHOPOD; *gn*₂, SECOND GNATHOPOD; *mx*₁, FIRST MAXILLA; *mx*₂, SECOND MAXILLA; *mnp*, MAXILLIPED; *t*, TELSON; *ur*₃, THIRD UROPOD.

Locality.—Described from a single female carrying ova; Station 4257, vicinity of Funter Bay, Lynn Canal, Alaska, 350 fathoms.

Type.—Cat. No. 38539, U.S.N.M.

Genus ARUGA,^a new.

Side plates deep. Antennæ short; secondary flagellum of first pair well developed; peduncle of second pair with none of the joints expanded. Upper lip produced forward into a rounded keel-like

^a No etymology.

projection which is separated from the epistome by a narrow fissure. Mandibles rather narrow; palp slender and situated near the middle of the mandible; cutting edge rather narrow and edentate; molar small and situated nearer the distal end than the palp. First maxillæ with the inner plate devoid of terminal setæ; palp two-jointed, bent around the outer plate, the second joint crenulate to minutely dentate around the distal end. Plates of second maxillæ narrow, setose distally. Maxillipeds with the inner plate narrow, devoid of spines, and reaching the middle of the outer plate; outer plate devoid of spines, crenulate to minutely dentate on the margin; palp slender; dactyl spiniform. First gnathopods simple; second subchelate, to chelate. Peræopods rather slender, the basal joints of the last three pairs widely expanded. Gills with plates on both sides. Uropods with styliform rami, the last pair smaller than the others, with the rami subequal. Telson short, entire.

Type of genus.—*A. oculata*, new species.

This genus is allied to *Lysianella*, but differs in the absence of setæ on the inner ramus of the first maxillæ and in the simple first gnathopods.

ARUGA OCULATA, new species.

Eyes large, oblong. Lateral angles of the head produced into an acute triangular lobe. First antennæ with the second joint of the peduncle nearly as long as wide; third very short; first joint of flagellum elongated; secondary flagellum with about five joints. Second antennæ about as long as the first, last two joints of peduncle of nearly equal length. Outer plate of maxillipeds devoid of setæ and reaching end of second joint of palp. First gnathopods rather stout; side plate large and expanded below. Second gnathopods with very narrow basal joint; hand small, with the lower posterior angle produced so as to make it almost chelate. First and second peræopods with the merus widened and produced into an acute lobe at the lower anterior angle. Third peræopods short, the basal joint as wide as deep; merus dilated and produced at the infero-posterior angle. Fourth and fifth peræopods more elongate, the broad basal joints serrated behind; merus slightly dilated in the fourth and not unusually so in the fifth; dactyls rather narrow and smooth. Third abdominal segment with a sinus above the not very prominent lateral angle. Fourth segment with a dorsal depression near the base. Uropods reaching back to about the same point; peduncles armed above with spines which are well developed in the first and second pairs but small in the third. Rami of first pair subequal, styliform, shorter than the peduncle, and armed with few spines; in the second pair the rami are subequal and much longer than the peduncle; the outer ramus is styliform and evenly tapering but the inner one is

furnished with a notch at about its posterior third just proximal to which is a small prominence bearing a large spine. Third uropods

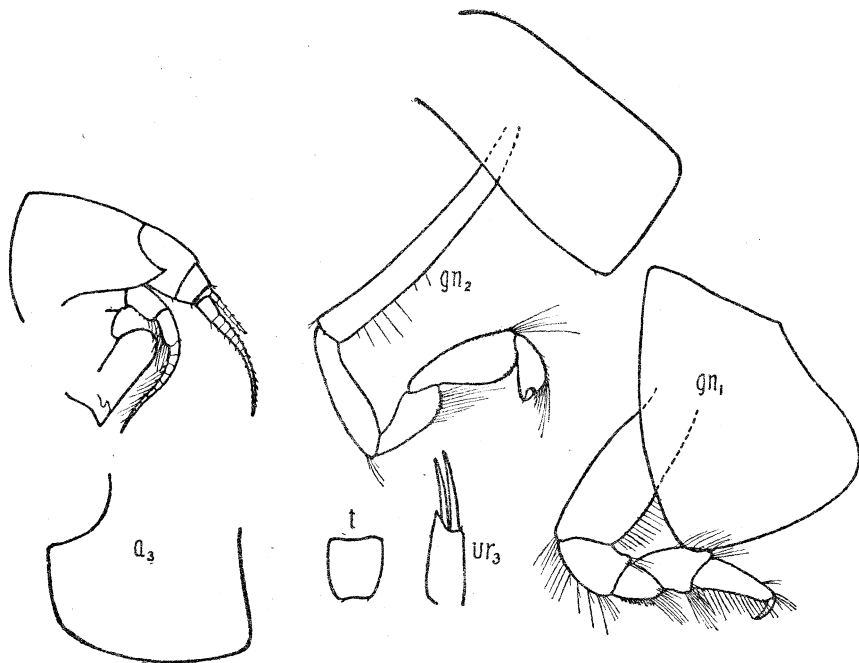


FIG. 14.—*ARUGA OCLATA*. *a*₃, THIRD SEGMENT OF THE ABDOMEN; *gn*₁, FIRST GNATHOPOD; *gn*₂, SECOND GNATHOPOD; *t*, Telson; *ur*₃, THIRD UROPOD.

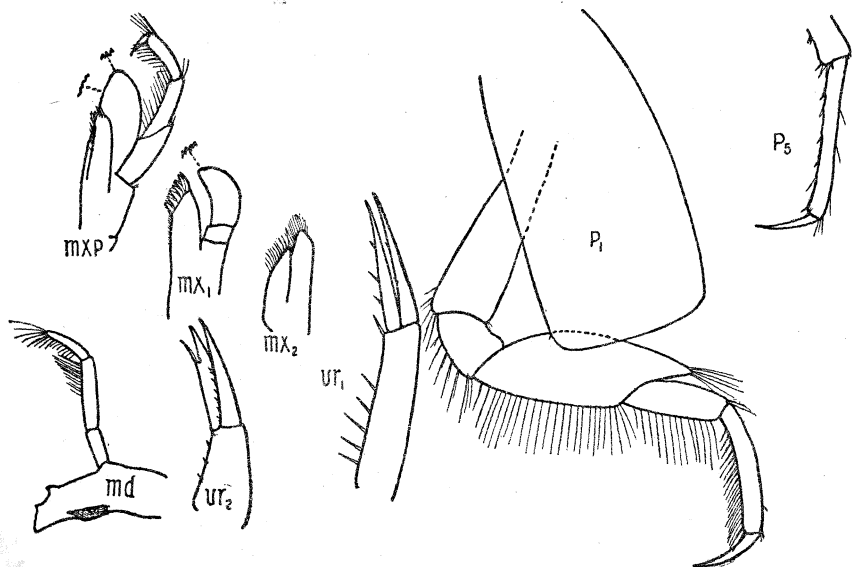


FIG. 15.—*ARUGA OCLATA*. *md*, MANDIBLE; *mx*₁, FIRST MAXILLA; *mx*₂, SECOND MAXILLA; *m**x**p*, MAXILLIPED; *p*₁, FIRST PEREPOD; *p*₅, FIFTH PEREPOD; *ur*₁, FIRST UROPOD; *ur*₂, SECOND UROPOD.

with the peduncle slightly longer than the rami and produced at the

upper posterior angle, rami narrow, equal and furnished with one or more minute spinules near the tip. Telson a little longer than wide, the posterior margin very slightly concave and furnished with a pair of very short setæ on either side of the middle.

Length.—14 mm.

Locality.—A single female specimen from Station 4304, off Point Loma, 25 fathoms.

Type.—Cat. No. 38540, U.S.N.M.

FAMILY AMPELISCIDÆ.

AMPELISCA CRISTATA, new species.

Eyes surrounded by red pigment. First antennæ very short, the first joint a little over half length of second. Second antennæ about

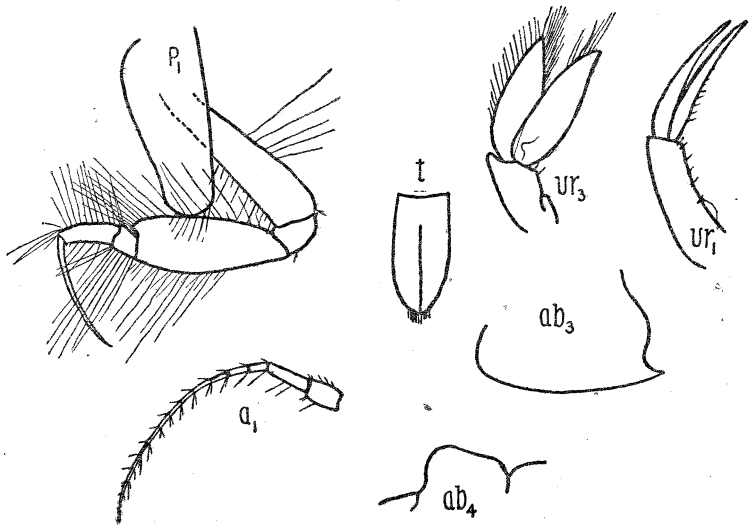


FIG. 16.—AMPELISCA CRISTATA, FEMALE. *a*₁, FIRST ANTENNA; *ab*₃, THIRD SEGMENT OF THE ABDOMEN; *ab*₄, FOURTH SEGMENT OF THE ABDOMEN; *p*₁, FIRST PEREPOD; *t*, TELSON; *ur*₁, FIRST UROPOD; *ur*₃, THIRD UROPOD.

the length of body; last basal joint about three-fifths length of preceding one. Hand of first gnathopod narrower than carpus and about two-thirds as long, almost simple. Hand of second gnathopods less than half length of propodus. Dactyl of first two pereopods larger than two preceding joints, merus of first produced to about middle of carpus in front. Fourth pereopods with anterior margin of basal joint produced and rounded where it is furnished with plumose setæ; remaining joints armed in front with spines. Ischium of last pereopods much wider than long; basal lobe produced to beyond middle of merus, with the lower margin transverse; merus produced into a pointed lobe behind carpus nearly to its

middle; carpus longer than merus, produced behind a little more than in front; dactyl attenuate, shorter than propodus. Postero-inferior angle of third abdominal segment produced into an acute tooth, above which the margin is strongly bisinuate. Fourth abdominal segment with a rather prominent dorsal crest which is rounded behind.

First uropods reaching but slightly beyond peduncle of third pair, with equal rami about as long as the peduncle; outer ramus without spines; inner with several, mainly on basal half. Second uropods with equal rami about as long as peduncle, armed on one side with several spines, along subterminal spine on outer ramus. Rami of third pair broad, equal, furnished with long plumose setae, inner

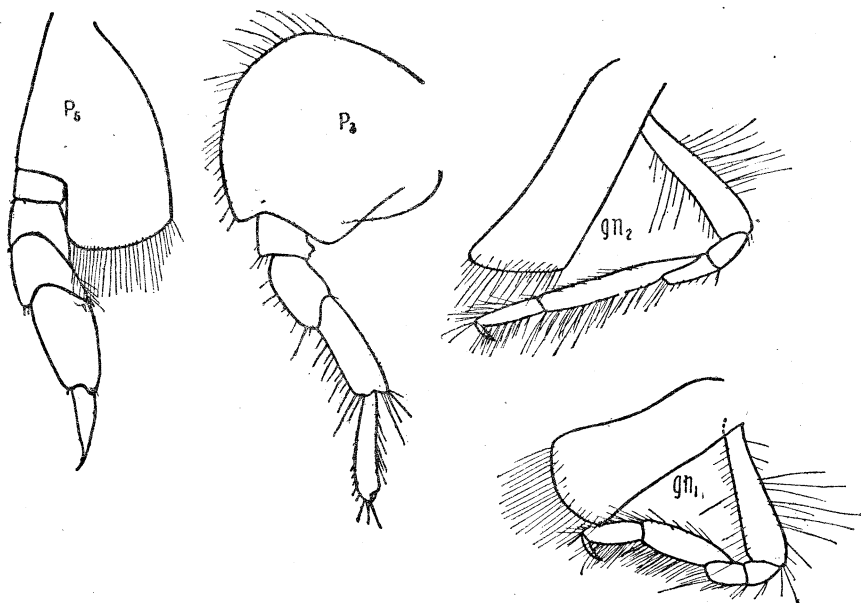


FIG. 17.—AMPELISCA CRISTATA, FEMALE. gn_1 , FIRST GNATHOPOD; gn_2 , SECOND GNATHOPOD; p_3 , THIRD PEREOPOD; p_5 , FIFTH PEREOPOD.

with a prominence on lower side of base. Telson elongated, tip rounded and armed with several spinules.

Length.—14 mm.

Locality.—Station 4304, off Point Loma, 25 fathoms.

Type.—Cat. No. 38541, U.S.N.M.

Additional locality.—Station 4549, Monterey Bay, 56–57 fathoms.

This species is very closely allied to *A. macrocephala*, but differs in having a single well-developed crest on the dorsal side of the fourth abdominal segment instead of a depression followed by a small carina; the telson differs in having several spinules at the tip of each lobe instead of a single one; the rami of the terminal uropods are somewhat broader.

AMPELISCA PLUMOSA, new species.

Female.—Corneal lenses absent. Head about as long as the first three thoracic segments. First antennæ about half the length of the second; second joint about twice length of first; flagellum three times length of peduncle. Second antennæ as long as the body; a laminate process below base of peduncle divided into two lobes the posterior of which is acute; last joint of slender peduncle two-thirds length of preceding one; side plates with long plumose setæ on lower margin; infero-posterior angle of first two pairs with a small tooth. Hand of first gnathopods about as long and broad as

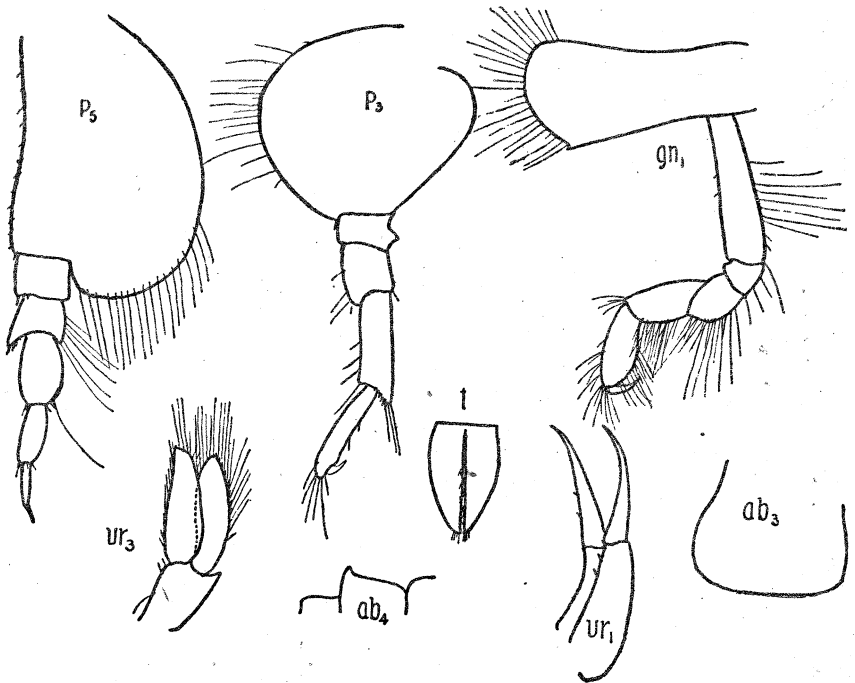


FIG. 18.—AMPELISCA PLUMOSA, FEMALE. *ab*₃, THIRD SEGMENT OF THE ABDOMEN; *ab*₄, FOURTH SEGMENT OF THE ABDOMEN; *gn*₁, FIRST GNATHOPOD; *p*₃, THIRD PERÆOPOD; *p*₅, FIFTH PERÆOPOD; *t*, TELSON; *ur*₁, FIRST UROPOD; *ur*₃, THIRD UROPOD.

carpus; second gnathopods much longer than first, very slender, the carpus about twice the length of the narrow hand. Dactyl of the first two peræopods fully as long as the two preceding joints combined. Third and fourth peræopods with few setæ and no spines except on distal end of carpus. Basal joint of last peræopods produced downward only to end of following joint; merus scarcely longer than ischium, and produced downward both in front and behind; the two following joints of subequal length and slightly longer than the straight dactyl.

Infero-lateral angle of third abdominal segment rounded. Fourth abdominal segment with a dorsal carina which increases in height toward the posterior end, where it is somewhat upturned. Rami of first uropods slender, about as long as peduncle; the outer one slightly narrower than the inner, but nearly as long and devoid of spines; inner ramus with two short spines. Rami of second uropods shorter than peduncle, much broader than those of first pair, nearly equal in length and armed with several short spines. Terminal uropods with flattened subequal rami furnished with long plumose setae; extremities blunt. Telson twice as long as broad, cleft to base, and tapering beyond middle.

Length.—13 mm.

Locality.—Station 4381, a single female specimen, off North Coronado Island, 618–667 fathoms.

Type.—Cat. No. 38542, U.S.N.M.

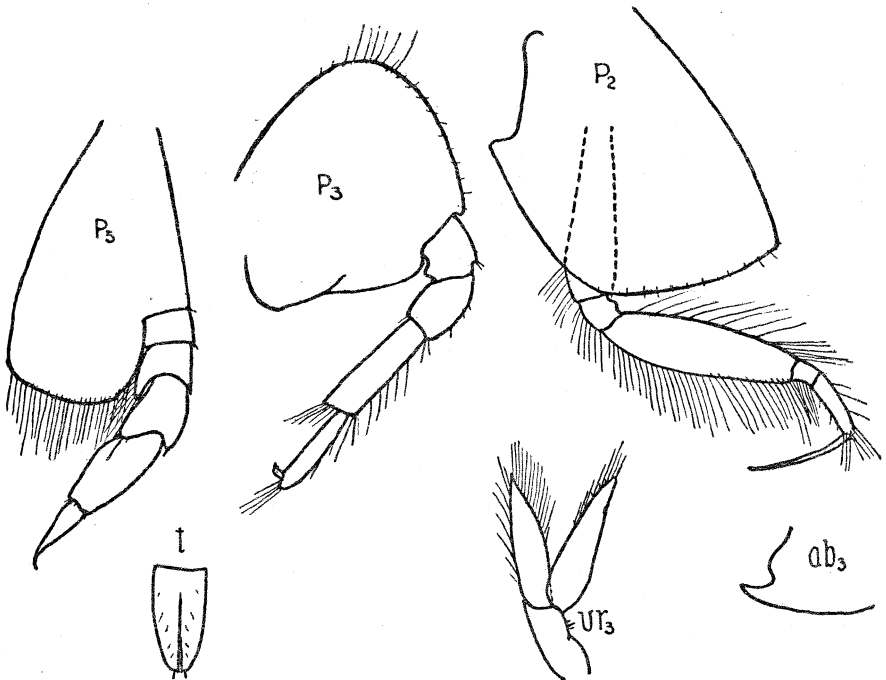


FIG. 19.—AMPELISCA MACROCEPHALA, FEMALE. *ab*₃, THIRD SEGMENT OF THE ABDOMEN; *p*₂, SECOND PEREPOD; *p*₃, THIRD PEREPOD; *p*₅, FIFTH PEREPOD; *t*, TELSON; *ur*₃, THIRD UROPOD.

AMPELISCA MACROCEPHALA Lilljeborg.

Localities.—Station 4522, Monterey Bay, 130–149 fathoms, one specimen; Station 4549, Monterey Bay, 56–57 fathoms, two specimens; Station 4551, Monterey Bay, 46–56 fathoms, one specimen; Station 4555, Monterey Bay, 66–69 fathoms, one specimen.

AMPELISCA PACIFICA, new species.

First antennæ very slender, scarcely one-fourth the length of the body, the tumid first joint about a third the length of the second and about equal to the third; flagellum longer than peduncle and composed of about ten or twelve narrow joints. Peduncle of second antennæ about as long as first pair, the last joint of the peduncle four-fifths the length of the preceding one. First gnathopods with hand shorter than carpus; hand of second gnathopods about half the length of carpus. Dactyl of first and second peræopods longer than the two preceding joints combined; merus of first peræopods produced in front

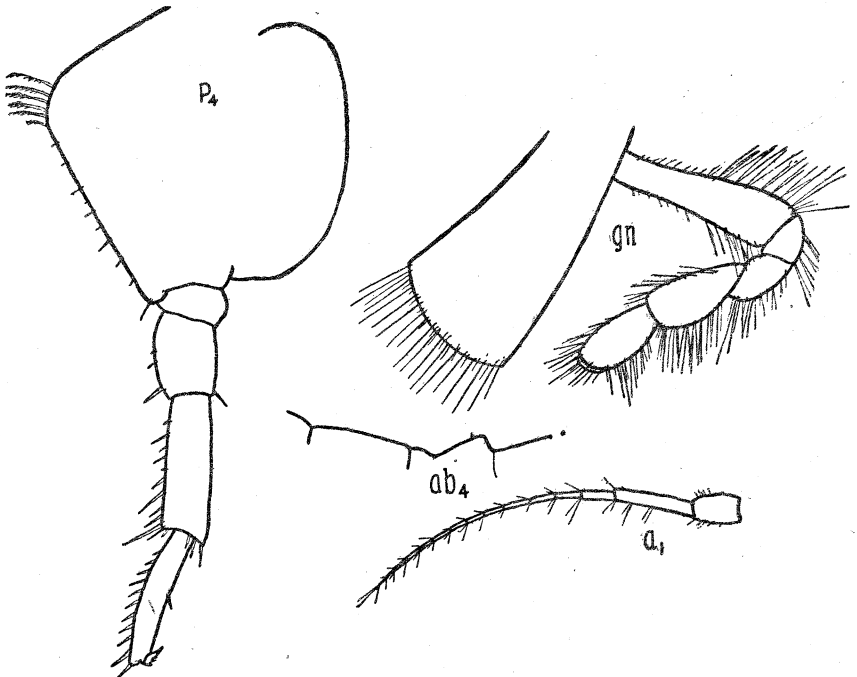


FIG. 20.—AMPELISCA PACIFICA, FEMALE. *a*₁, FIRST ANTENNA; *ab*₄, FOURTH ABDOMINAL SEGMENT; *gn*, GNATHOPOD; *p*₄, FOURTH PERÆOPOD.

nearly to distal end of carpus; much less strongly produced in second pair. Fourth peræopods with spines on anterior margin of carpus and propodus. Tail of basal joint of last peræopods produced to middle of merus; ischium broader than long; merus produced downward posteriorly to beyond middle of carpus and bearing about six long plumose setæ on outer side of expansion, and a spine at the tip; carpus as long as merus on posterior side, armed with several spines at lower extremity, both in front of and behind propodus, and a single spine on anterior margin; dactyl attenuate at tip, shorter than propodus. Infero-posterior angle of third abdominal segment pro-

duced into a prominent acute tooth, above which the margin is bisinuate. Dorsal side of fourth abdominal segment with a shallow

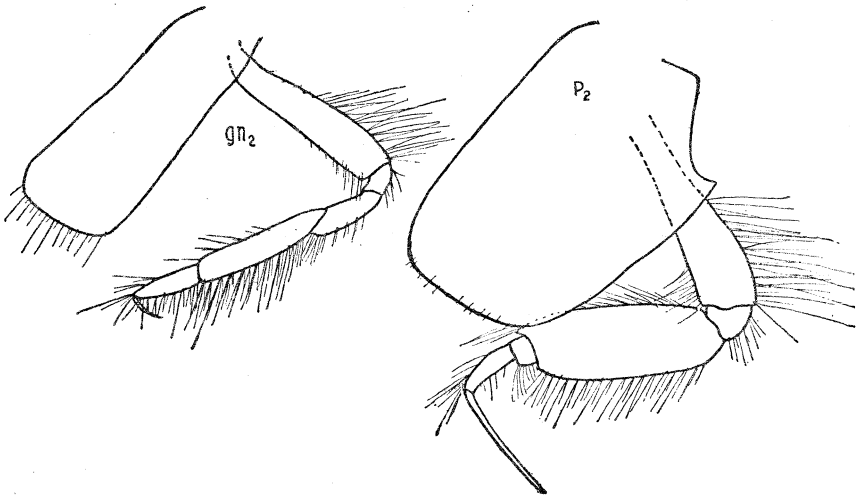


FIG. 21.—AMPELISCA PACIFICA FEMALE. gn_2 , SECOND GNATHOPOD; p_2 , SECOND PEREPOD.

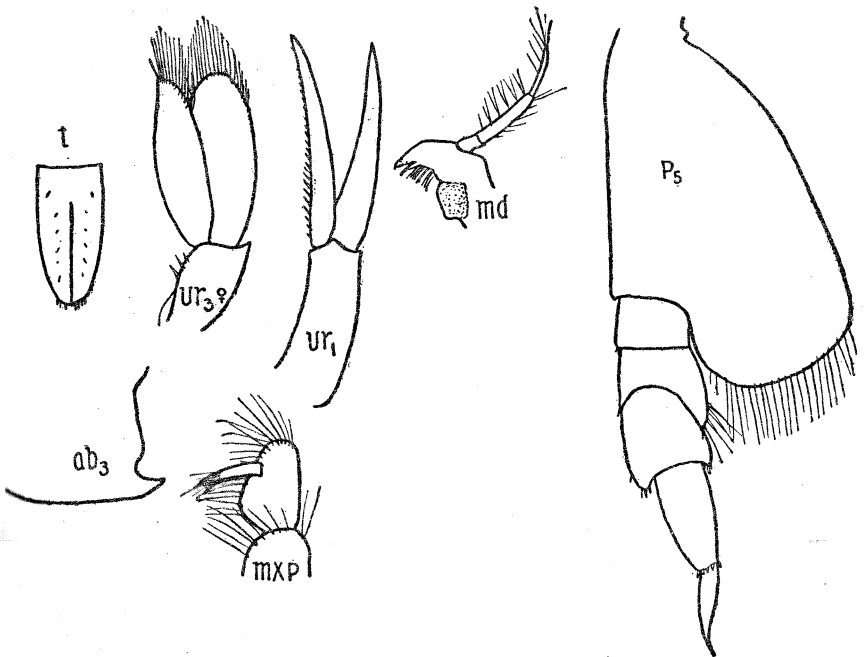


FIG. 22.—AMPELISCA PACIFICA, FEMALE. ab_3 , THIRD ABDOMINAL SEGMENT; md , MANDIBLE; mxp , TIP OF MAXILLIPED; p_5 , FIFTH PEREPOD; t , TELSON; ur_1 , FIRST UROPOD; ur_3 , THIRD UROPOD.

concavity near the middle, behind which it is somewhat elevated; the other segments smooth above.

Rami of first uropods longer than peduncle, subequal and reaching to middle of rami of third pair, outer ramus devoid of spines, inner with twenty to twenty-five on upper margin. Second uropods with rami equal, a little longer than peduncle, armed with several short spines on one edge, outer ramus with a very long spine near tip. Third uropods with broad, flat rami broadly rounded at tip except for a small cusp, and furnished distally with long plumose setæ. Telson elongate and armed with about four short spines on either lobe.

Length.—12 mm.

Locality.—Station 4549, Monterey Bay, 56–57 fathoms, two females; Station 4556, Monterey Bay, 56–59 fathoms, one female, type.

Type.—Cat. No. 38543, U.S.N.M.

This species is readily distinguished from the others here described, as well as most others of the genus, by the wide rami of the terminal uropods with their broadly rounded extremities. The penultimate joint of the palp of the maxillipeds is peculiar in being produced beyond the articulation of the dactyl, so that the latter appears to arise from near the middle of the inner margin.

AMPELISCA CALIFORNICA, new species.

Female.—Head about as long as first three segments of thorax; lower pair of eyes on anterior margin of head. First antennæ but slightly exceeding peduncle of second, the second joint three times length of first; flagellum over twice length of peduncle. Second antennæ nearly as long as body; last joint of elongate peduncle a little shorter than preceding one; flagellum nearly twice the peduncle. First gnathopods with hand shorter than carpus; palm at angle of about 45° with posterior margin of hand. Second gnathopods considerably longer and more slender than the first; hand about half the length of the narrow carpus. First two peræopods with the dactyl over a half longer than the two preceding joints combined. Third and fourth peræopods with plumose setæ around the prominent rounded anterior projections of the basal joints; anterior margin of propodus of fourth peræopod armed with long spines which are absent on corresponding joint of third pair. Last pair of peræopods with basal joint produced slightly beyond end of the ischium, which is nearly as long as broad; merus produced obliquely downward posteriorly into a large oblong lobe fringed with plumose setæ; carpus produced downward in front into an acute triangular lobe whose lower margin is furnished with a few setæ and three stout spines, each bearing a small cilium; anterior margin with a small prominence near the lower end bearing a short spine; dactyl shorter than propodus and attenuate and flexible at tip.

Infero-posterior angle of third abdominal segment produced into a tooth. Fourth abdominal segment with a dorsal crest, which bears

an elevation near the middle and a sharper one at posterior end. First uropods not nearly reaching the middle of the rami of second uropods, with equal and narrow rami, the inner one armed with about six spines; the outer one smooth. Second uropods with rami rather stout, subequal, about as long as peduncle and armed with numerous short spines in the margins, the outer ramus bearing also a very long slender spine near the tip. Third uropods with narrow subequal rami; outer one with plumose setæ on inner margin; both rami devoid of spines, but a pair of spines on upper distal angle of peduncle. Telson narrow, inner sides of the two lobes produced into an acute point, between which and a smaller second point are about four small setæ.

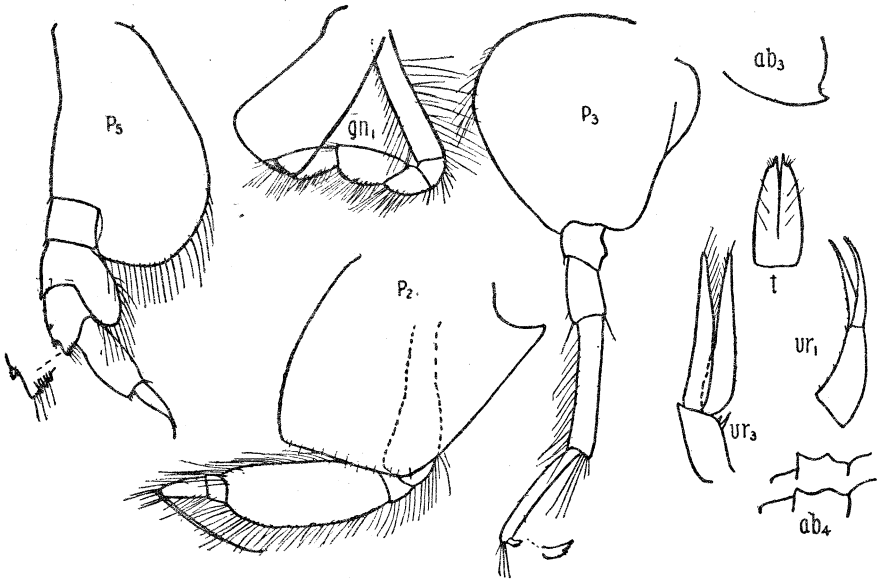


FIG. 23.—*AMPELISCA CALIFORNICA*, FEMALE. THE UPPER FIGURE OVER ab_4 IS FROM A MALE FROM STATION 4549. ab_3 , THIRD SEGMENT OF THE ABDOMEN; ab_4 , FOURTH SEGMENT OF THE ABDOMEN; gn_1 , FIRST GNATHOPOD; p_2 , SECOND PEREPOD; p_3 , THIRD PEREPOD; p_5 , FIFTH PEREPOD; t , TELSON; ur_1 , FIRST UROPOD; ur_3 , THIRD UROPOD.

Male.—The first antennæ may not reach beyond the end of the penultimate joint of the second pair, and the latter may be much longer than the body.

Length.—15 mm.

Localities.—Station 4342, off South Coronado Island, 53–66 fathoms; Station 4433, off Santa Rosa Island, 243–265 fathoms; Station 4436, off San Miguel Island, 264–271 fathoms; Station 4549, Monterey Bay, 56–57 fathoms.

Type.—Cat. No. 38544, U.S.N.M.

This species is allied to *A. brevicornis* (Costa), but the fourth joint of the first pereopods is not produced into a prominent distal lobe; the tooth at the infero-posterior angle of the third abdominal seg-

ment is not so prominent nor the margin above it so strongly sinuous; the dactyls of the first two peræopods are longer, and the telson has a very different extremity. It is distinguished from most species of the genus, except *brevicornis*, by the very large lobe on the posterior side of the merus of the last peræopods. In a male specimen from Station 4549 the anterior elevation on the dorsal side of the fourth abdominal segment was acute and the posterior one more prominent than in the other specimens examined. The terminal uropods are about the same in the two sexes, except that the rami are somewhat broader in the male. The species also resembles *A. pugetica* Stimpson, but the last three abdominal segments can scarcely be said to be "separated from the preceding ones by a deep notch."

AMPELISCA CCECA, new species.

Eyes absent. First antennæ but little longer than the peduncle of the second; the peduncle not reaching the middle of the antepenul-

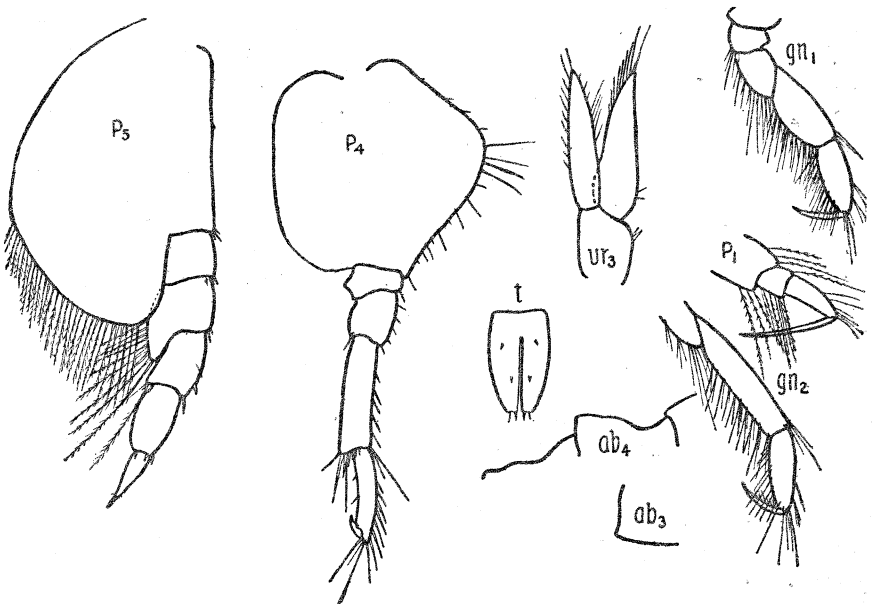


FIG. 24.—AMPELISCA CCECA. *ab*₃, THIRD SEGMENT OF THE ABDOMEN; *ab*₄, FOURTH SEGMENT OF THE ABDOMEN; *gn*₁, FIRST GNATHOPOD; *gn*₂, SECOND GNATHOPOD; *p*₁, FIRST PERÆOPOD; *p*₄, FOURTH PERÆOPOD; *p*₅, FIFTH PERÆOPOD; *t*, TELSON; *ur*₃, THIRD UROPOD.

timate joint of the peduncle of the second pair; first joint over half as thick as long and about half the length of the second; flagellum about eighteen-jointed. Second antennæ about as long as the body; the last two joints of the slender elongated peduncle of subequal length.

First gnathopods with the hand narrowly oval with the palm and posterior margin forming an even regular curve. First and second peræopods with the dactyls slightly longer than the two preceding joints combined. Third peræopods with the basal joint broadly and evenly rounded in front with a few plumose setæ near the middle of the anterior margin; posterior margin produced into a very prominent rounded lobe; carpus with two pairs of short spines near the anterior margin and a cluster at the lower margin; propodus with two spines on posterior margin and with several setæ but no spines in the anterior one. Fourth peræopods with a few plumose setæ near the middle of the rounded and projecting anterior margin; carpus with five or six spines on anterior margin and a cluster of several at the distal end; propodus with two spines on posterior margin and a row of eight or nine on the distal two-thirds of the anterior margin. Basal joint of the last peræopods with the posterior expansion obliquely rounded off below; third joint about as long as the fourth, exclusive of the posterior lobe; fourth joint with a posterior lobe extending behind the following joint as far as its distal third or fourth and furnished with about nine long plumose setæ on its posterior and distal margins; fifth joint about as long as the sixth; dactyl markedly shorter than the preceding joint.

Infero-posterior angle of the third abdominal segment almost a right angle and but very slightly produced. Fourth segment with a dorsal depression anteriorly, followed by crest whose posterior end is considerably above the following segment. Third uropods with rather broadly lanceolate rami, which are devoid of marginal spines but are furnished with setæ on the distal portion of their opposed margins and along the outer side of the outer ramus. Telson twice as long as broad, armed with two pairs of dorsal spinules, and furnished with a spinule and a seta at the tip of each lobe.

Length.—12 mm.

Locality.—A single specimen from Station 4415, off Santa Barbara Island, 302–638 fathoms, along with specimens of *Acanthopleustes annectens*.

Type.—Cat. No. 38545, U.S.N.M.

This species resembles *A. odontoplax* Sars, but the head is not carinate dorsally; the first pairs of side plates are devoid of a tooth at the infero-posterior angle, the hand of the first gnathopods has the posterior margin more evenly curved, and the posterior expansion of the last peræopods is oblique instead of transversely truncated below. From *A. californica* it is readily distinguished by its absence of eyes, by the smaller posterior lobe of the merus of the posterior peræopods, by the broader terminal uropods, and by the extremity of the telson.

AMPELISCA LOBATA, new species.

Lower pair of eyes on the margin of the head. First antennæ nearly half as long as the body, the first segment of the peduncle about as long as the second one, the third very short; flagellum over three times the length of the peduncle. Second antennæ nearly as long as the body, the last joint of the peduncle nearly as long as the preceding.

First gnathopods with the hand narrowly oval, shorter and much narrower than the carpus, the palm and posterior margin forming an even curve. Hand of second gnathopods two-thirds the length of the carpus; dactyl about three-fourths the length of the hand.

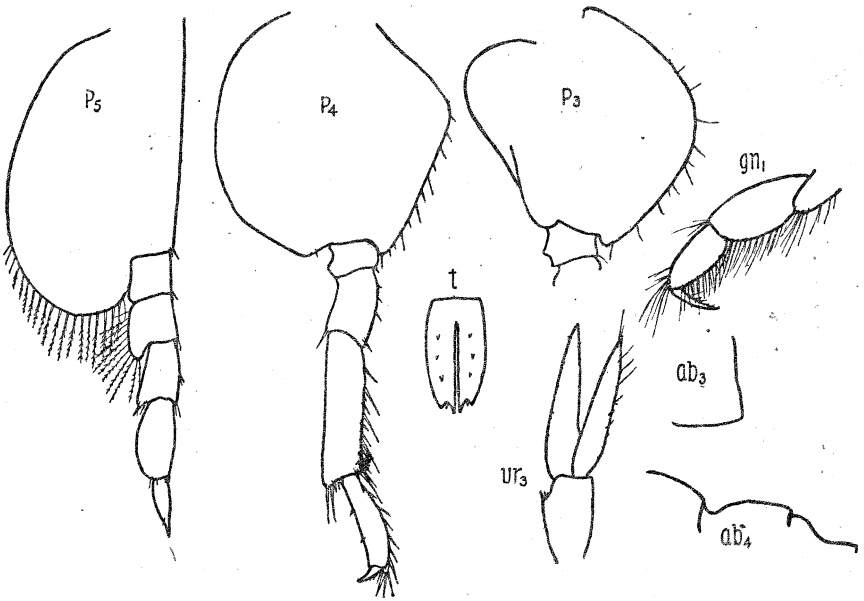


FIG. 25.—AMPELISCA LOBATA. *ab*₃, THIRD SEGMENT OF THE ABDOMEN; *ab*₄, FOURTH SEGMENT OF THE ABDOMEN; *gn*₁, FIRST GNATHOPOD; *p*₃, THIRD PEREPOD; *p*₄, FOURTH PEREPOD; *p*₅, FIFTH PEREPOD; *t*, TELSON; *ur*₃, THIRD UROPOD.

First and second peræopods with the dactyl about as long as the two preceding joints combined. Third peræopods with a very prominent lobe on the posterior side of the basal joint much as in *A. cæca*; carpus armed as in *cæca*. Fourth peræopods with the anterior margin furnished with several spines and projecting at the middle, but devoid of plumose setæ; carpus with about five long and many more short spines on the anterior margin, and a cluster at the distal end; propodus with about six spines on the anterior margin. Last peræopods with the posterior expansion of the basal segment rather narrow, rounded below, and produced but slightly beyond the end of the ischium; merus with a posterior lobe which is produced

downward but not so far as the middle of the following joint and furnished with ten to twelve plumose setæ.

Infero-posterior angle of third abdominal segment nearly a right angle and not produced. Fourth segment with a dorsal depression followed by an elevation, which does not end posteriorly in a tooth. Third uropods with lanceolate flattened rami which are furnished with a few setæ; a few short spines on outer margin of the outer ramus. Telson twice as long as wide, with a notch at the tip of each lobe in which is situated a short spine; the inner side of the notch prolonged into an acute point.

Length.—9 mm.

Locality.—A single specimen from Station 4420, off San Nicolas Island, 32–33 fathoms.

Type.—Cat. No. 38546, U.S.N.M.

This species is unusual in having the peduncle of the first antennæ very short, with the first and second joints of nearly equal length. It resembles *A. cæca*, but differs from it, in addition to having well developed eyes, in having a narrower posterior lobe on the basal joint of the last peræopods which is not produced so far downward, in having the elevation on the fourth abdominal segment less high, in having the outer branch of the terminal uropods armed with short spines on the outer margin, and in the distal extremity of the telson.

HAPLOOPS TUBICOLA Lilljeborg.

A single specimen from Station 4454, Monterey Bay, 65–71 fathoms.

BYBLIS GAIMARDII Krøyer.

A single specimen each from Monterey Bay, Stations 4549, 56–57 fathoms; and 4551, 46–56 fathoms.

Family PHOXOCEPHALIDÆ.

PARAPHOXUS ROBUSTUS, new species.

Head nearly as long as the first three segments of the thorax, the hood evenly convex above and subacute at the tip. Eyes very large in the male, nearly meeting above, small and oblong in the female. First antennæ with the second joint nearly as long as the first; flagellum shorter than the peduncle; secondary flagellum over half the length of the primary. Second antennæ about the same in the two sexes, about as long as the first, the penultimate joint expanded, furnished laterally with a row of several spines, and with numerous long plumose setæ on the lower margin; last basal joint with two groups of lateral spines; flagellum seven-jointed and scarcely as long as the last two joints of the peduncle. Mandibles much as in *P. oculatus*. Maxillipeds with the outer plate reaching nearly to the

middle of the second joint of the palp, the inner margin armed with eight curved spines which increase rapidly in length toward the distal end.

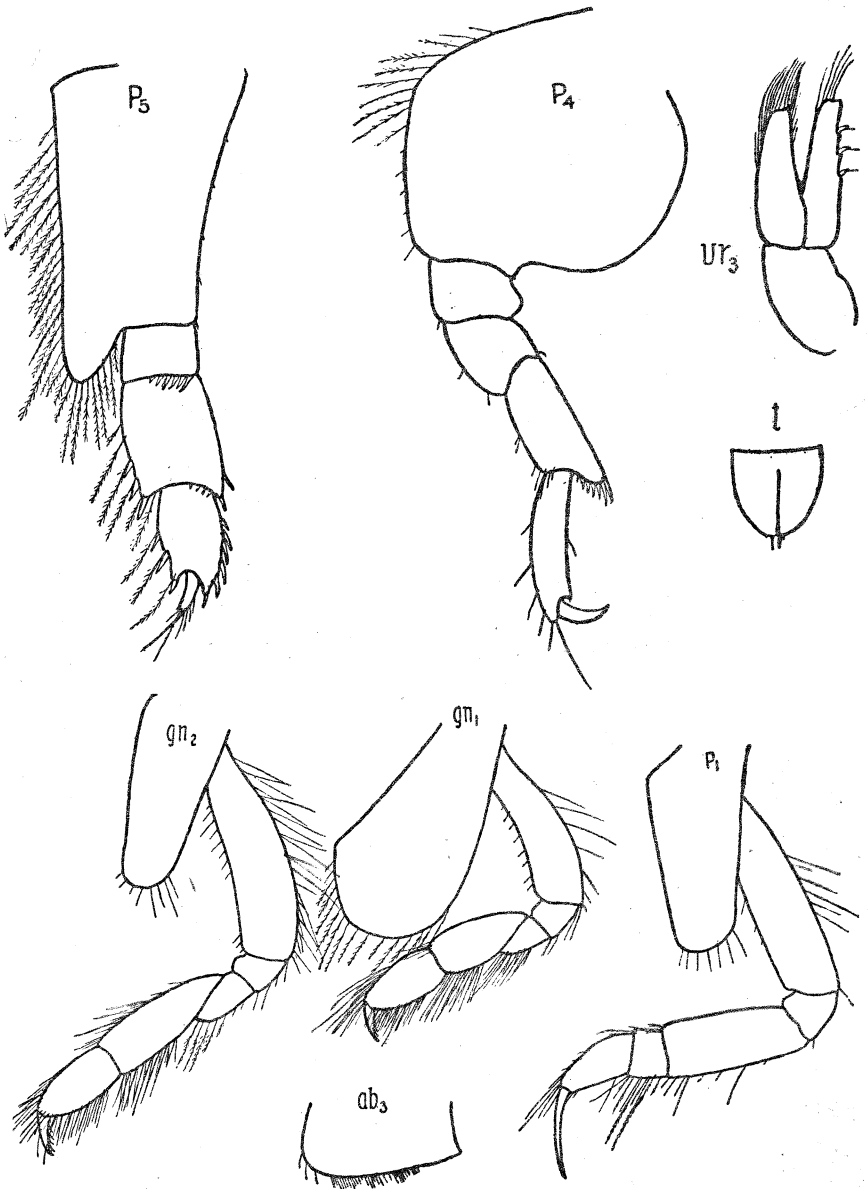


FIG. 26.—HAPLOOPS TUBICOLA. *ab*₃, THIRD SEGMENT OF THE ABDOMEN; *gn*₁, FIRST GNATHOPOD; *gn*₂, SECOND GNATHOPOD; *p*₁, FIRST PEREPOD; *p*₄, FOURTH PEREPOD; *p*₅, FIFTH PEREPOD; *t*, TELSON; *ur*₃, THIRD UROPOD.

Gnathopods similar in shape, the second slightly the larger, the hands rather narrower than in *oculatus*, and not widened distally. The side plate of the first pair bears about eighteen plumose setae in

the lower margin, that of the second pair about twelve. First and second peræopods with a very large spine at the distal end of the carpus, which extends as far as the tip of the propodus; dactyls curved and about two-thirds the length of the preceding joint. Fourth peræopods stouter than in *oculatus*, the entire anterior margin of the basal joint furnished with plumose setæ and the lower portion of the anterior margin armed with short spines. Basal joint of last peræopods broadly oval in general outline, the posterior margin with about seven rather large serrations, the lower margin not serrate but furnished with about six very short setæ.

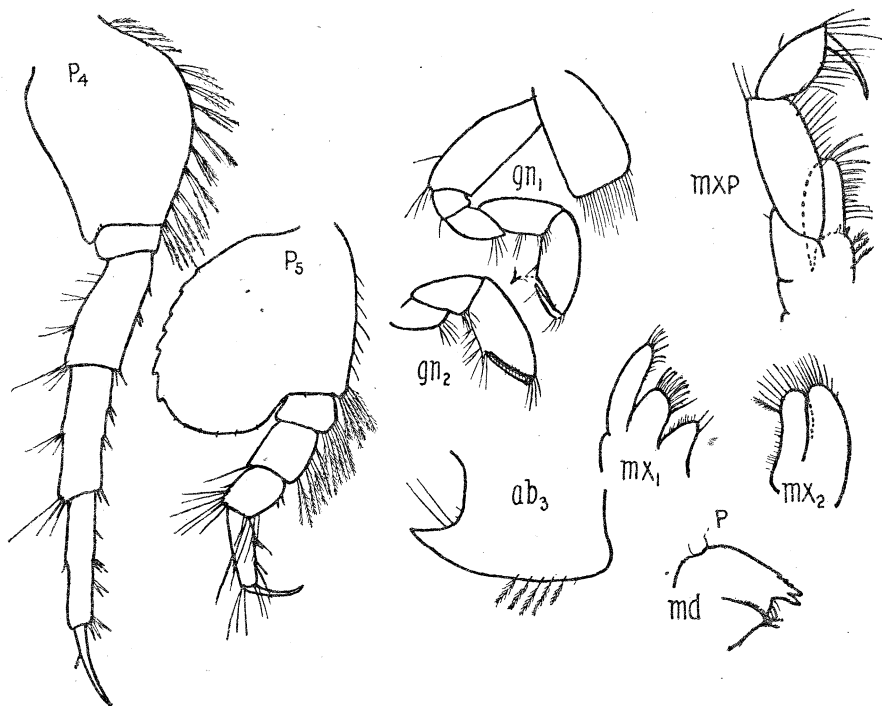


FIG. 27.—*PARAPHOXUS ROBUSTUS*, FEMALE. *ab*₃, THIRD SEGMENT OF THE ABDOMEN; *gn*₁, FIRST GNATHOPOD; *gn*₂, SECOND GNATHOPOD; *md*, MANDIBLE; *mx*₁, FIRST MAXILLA; *mx*₂, SECOND MAXILLA; *mxp*, MAXILLIPED; *p*, PALP OF MANDIBLE WHICH IS NOT SHOWN IN THE FIGURE; *p*₄, FOURTH PERÆOPOD; *p*₅, FIFTH PERÆOPOD.

Third abdominal segment with several plumose setæ on the lower margin, infero-posterior angle produced into an acute lobe whose upper margin is furnished with seta. Third uropods with the inner ramus very short in the female; the rami nearly equal in the male and not fringed with plumose setæ. Telson oblong, deeply cleft, the lobes with long terminal seta.

Length.—8 mm.

Locality.—A male and a female specimen from Station 4304, off Point Loma, 25 fathoms.

Type.—Cat. No. 38547, U.S.N.M.

This species may readily be distinguished from *P. ocellatus* by its stouter appendages, by its acute infero-posterior angle of the third abdominal segment, by its narrower hands, and by the larger number of setæ on the lower margins of the anterior coxal plates. From *P. spinosus* it is readily distinguished by the much broader joints of the posterior peræopods and the larger serrations in the posterior margin of the basal joints of these appendages. The lack of fringes of plumose setæ on the terminal uropods in the male distinguishes it from the other species of the genus.

HARPINIA OCULATA, new species.

Eyes rather small, oblong, oblique; postantennal corners of the head not prominent. Antennæ short, subequal, the stout first joint

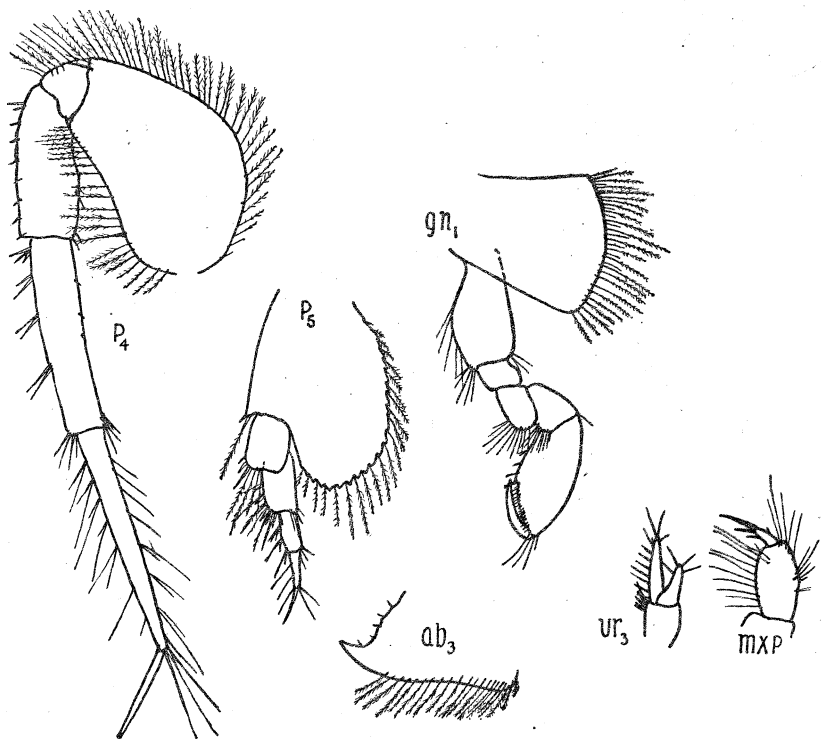


FIG. 28.—HARPINIA OCULATA, FEMALE. *ab*₃, THIRD SEGMENT OF THE ABDOMEN; *gn*₁, FIRST GNATHOPOD; *mxp*, END OF PALP OF MAXILLIPED; *p*₄, FOURTH PERÆOPOD; *p*₅, FIFTH PERÆOPOD; *ur*₃, THIRD UROPOD.

of the first antennæ much longer than the next two, the distal part of the lower margin furnished with about twelve distally plumose setæ, the second joint with about ten long setæ on the distal half of the lower margin; flagellum with about nine joints; secondary flagellum about two-thirds the length of the primary, and composed of about seven joints. Second antennæ with a very long narrow acute lobe

on the first basal joint; the expanded penultimate joint of the peduncle armed with nine spines and about ten plumose setæ around the lower anterior angle; distal part of lower margin of last basal joint with about eight long plumose setæ and a pair of long spines; flagellum with about nine joints. Mandibular palp very narrow, the last joint a little longer than the preceding and furnished with setæ on its oblique tip and distal half. First maxillæ with the small inner plate rounded and furnished with a large and a small seta; the joint between the first and second segments of the palp not so clearly marked as usual. Maxillipeds with the outer plate reaching about to the middle of the second joint of the palp; last joint of palp very small, furnished with a long curved spine at the tip and two smaller ones on the inner and a short seta on the outer margin.

First and second gnathopods of nearly the same size and shape; lower margin of coxa of first pair with over twenty-five plumose setæ, those of the three following appendages with fifteen to seventeen setæ. Penultimate peræopods long, basal joint with plumose setæ along the whole of both margins, the hind margin with a convexity near the base which is not so prominent as in *H. affinis*; terminal joint styliform, nearly straight and about half as long as the preceding. Last peræopods very small, the basal joint with about twenty-five serrations on the posterior, lower, and a part of the anterior margin; from each notch between the serrations arises a long plumose seta; ischium with three spines and four plumose setæ on prominent distal margin; merus with about seven spines on distal portion of anterior margin, many of them accompanied by long sparingly plumose setæ; carpus with three pairs of setæ on anterior margin; dactyl very slender and about as long as the propodus.

Third abdominal segment produced at the infero-posterior angle into an acute lobe, which is not strongly upturned; lower margin with about twenty-two plumose setæ; margin above posterior angle ciliated and furnished with a few slender spines. Fourth abdominal segment gently concave above with no prominent elevation. Outer ramus of third uropods about twice as long as the peduncle, armed with about eight spines on outer margin; terminal segment very small, scarcely longer than broad and bearing a pair of long spines; inner ramus about three-fifths the length of the outer, narrowing distally from an expanded base, and armed with four spines; the distal margin of the peduncle is armed with about ten spines; apices of telson divergent and broadly rounded.

Length.—8 mm.

Locality.—Single female specimen from Station 4342, off South Coronado Island, 53-66 fathoms.

Type.—Cat. No. 38548 U.S.N.M.

This species is distinguished from the other species of the genus hitherto described in having fairly conspicuous eyes. In every other respect it agrees perfectly with the generic characters of *Harpinia* as given by Sars and Stebbing.

HARPINIA AFFINIS, new species.

Female.—Hood prominent, apex rounded; sides of head with a small angular projection. Antennæ short, the peduncles scarcely

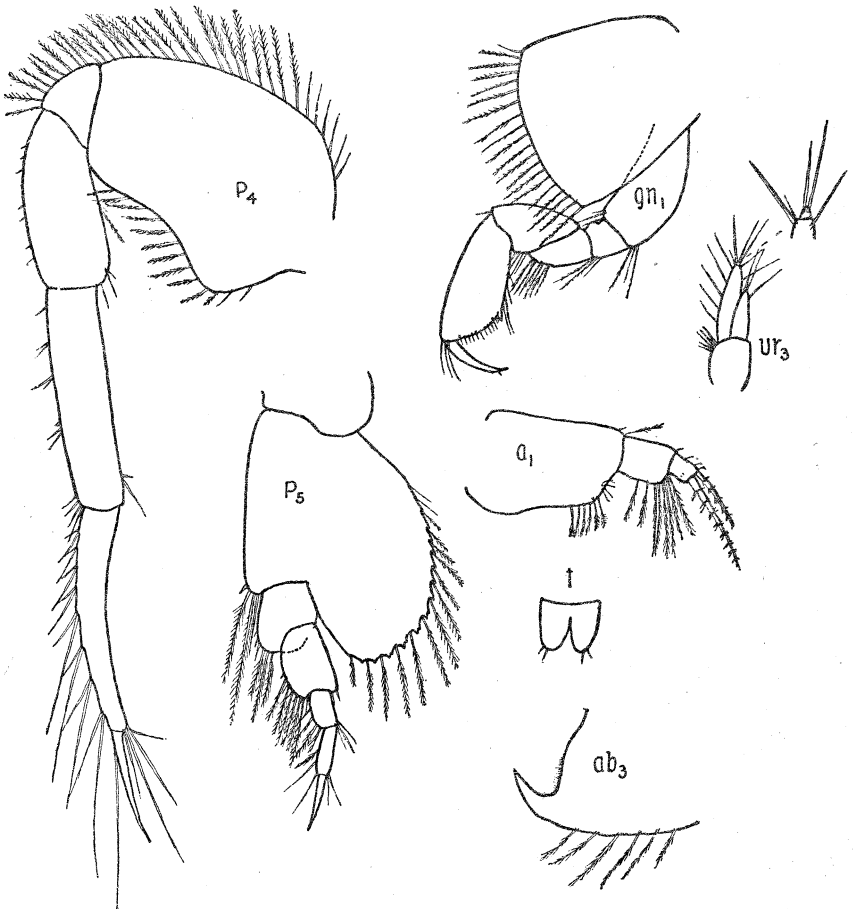


FIG. 29.—HARPINIA AFFINIS, FEMALE. *a*₁, FIRST ANTENNA; *ab*₃, THIRD SEGMENT OF THE ABDOMEN; *gn*₁, FIRST GNATHOPOD; *p*₄, FOURTH PEREPOD; *p*₅, FIFTH PEREPOD; *t*, TELSON; *ur*₃ THIRD UROPOD.

reaching tip of hood; first joint of first pair nearly equal to the rest of the appendage and furnished with about six plumose setæ at lower anterior angle; second joint with about eight plumose setæ on lower side; flagellum about nine-jointed; secondary flagellum over half the length of primary and consisting of about six joints. Second antennæ about as long as primary; about six long spines and nine or ten long

plumose setæ on expanded lower side of penultimate joint of peduncle; flagellum shorter than peduncle.

First gnathopods with about nineteen plumose setæ on lower margin of side plate; hand with an oblique palm, which is shorter than the posterior margin and defined above by a triangular tooth with a strong spine at its base. Second gnathopods much like the first; side plate with about fourteen plumose setæ. Fourth peræopod over half the length of the body, the basal joint with a prominent rounded lobe on upper half and bearing plumose setæ on posterior as well as anterior margin. Fifth peræopod with the posterior lobe of the basal joint strongly produced downward and rounded, and furnished with serrations with plumose setæ in the angles between them; the serrations increase in size around the postero-lateral angle where many of them become double pointed.

Third abdominal segment with plumose setæ on lower margin, the posterior angle produced into a long, strongly upturned tooth. Third uropod with the outer ramus fully twice the length of the peduncle, the outer margin armed with six spines, the inner with two; terminal joint minute, about as broad as long and bearing two long spines. Inner ramus slightly over half the length of outer, with two terminal spines and one on inner margin. Telson about as broad as long, the lobes rounded.

Length.—9 mm.

Locality.—A single female specimen from Station 4554, Monterey Bay, 60–80 fathoms.

Type.—Cat. No. 38549, U.S.N.M.

This species is closely allied to *Harpinia plumosa* (Krøyer), but it differs from it in having a much larger number of setæ on the lower margins of the side plates; in having rather more slender gnathopods; in having the posterior margin of the basal joint of the penultimate peræopods furnished with plumose setæ and a prominent lobe; in having several well marked and regularly arranged teeth or serrations on the posterior margin of the basal joint of the last peræopods, in having the second joint of the outer branch of the terminal uropods minute, and in having the outer margin armed with a greater number of spines. From *H. neglecta* it differs in having much less prominent lateral angles of the head and in having a more strongly upturned tooth on the third abdominal segment.

Family METOPIDÆ.

METOPA PACIFICA, new species.

Male.—First antennæ almost as large as the second, which nearly equals the length of the body; flagellum shorter than the peduncle, which extends slightly beyond the penultimate joint of the peduncle of the second antennæ. Peduncle of second antennæ very elongate,

the last two joints subequal; flagellum shorter than last joint of peduncle. Maxillipeds slender, with very small outer plate. First

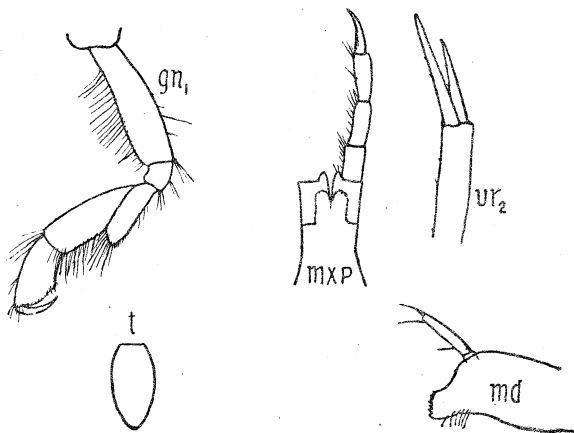


FIG. 30.—METOPA PACIFICA, MALE. THE MANDIBLE IS DRAWN TO A LARGER SCALE THAN THE OTHER FIGURES. *gn*₁, FIRST GNATHOPOD; *md*, MANDIBLE; *mXP*, MAXILLIPED; *t*, TELSON; *ur*₂, SECOND UROPOD.

gnathopods with carpus considerably longer than the hand, which is distinctly subchelate, widening distally; dactyl armed within with minute spinules. Second gnathopods large; a large tooth at distal

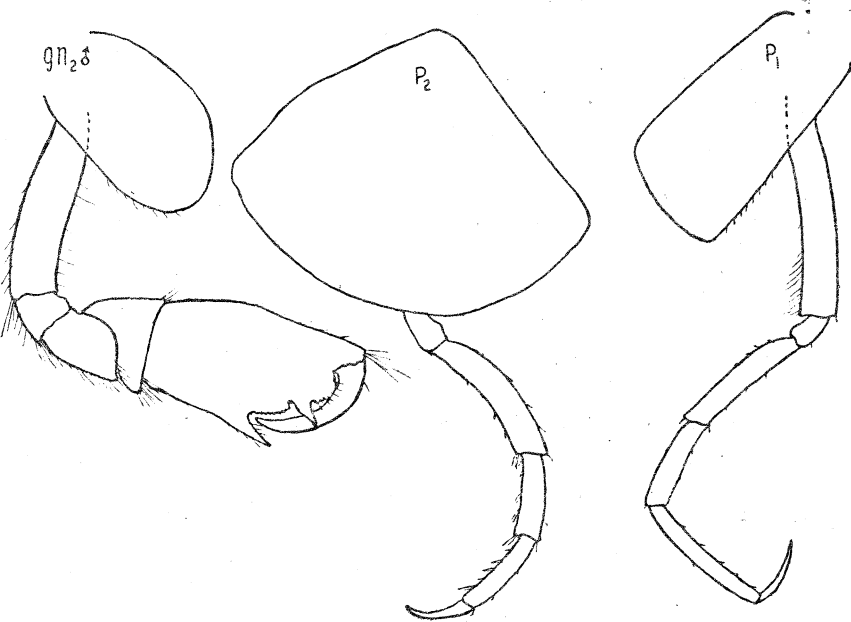


FIG. 31.—METOPA PACIFICA, MALE. *gn*₂, SECOND GNATHOPOD; *p*₁, FIRST PEREPOD; *p*₂, SECOND PEREPOD.

end of palm, another near the middle, proximal to which is a rounded dentate lobe; margin between the middle and distal teeth produced

and armed with small rounded teeth. First two peræopods slender, the first more so than the second, with the dactyl about half the length of the propodus; dactyl of the second pair about two-thirds the length of the propodus; stouter and more curved than in the first. Last three peræopods with the merus not widely expanded and only moderately produced downward at the lower angle; dactyls half the length of the propodi. Ramus of third uropods slightly longer than the peduncle, the second joint slightly larger than the first. Telson oval, obtuse.

Female.—The female has the palm of the hand of the second gnathopods much more regular than in the male; there is a tooth and a pair of spines at the distal end of the palm, a smaller tooth near the middle, with some irregular teeth between it and the articulation of the dactyl; several small rounded teeth between the middle of the palm and the distal end. The same features occur as in the hand of the male, but they are much less pronounced.

Length.—6 mm.

Locality.—Station 4516, Monterey Bay, 718–756 fathoms.

Type.—Cat. No. 38550, U.S.N.M.

Family PARDALISCIDÆ.

NICIPPE TUMIDA Bruzelius.

A single female specimen from Station 4549, Monterey Bay, 56–57 fathoms.

Family LILJEBORGIIDÆ.

LILJEBORGIA BREVICORNIS (Bruzelius).

A single specimen from Station 4430, of Santa Cruz Island, 197–281 fathoms.

Family CALLIOPHIDÆ.

Genus GRACILIPES,^a new.

Antennæ slender, elongated, with elongated peduncles, the first pair devoid of an accessory flagellum. Upper lip rounded, not bilobed. Mandibles with well-developed molar, dentate cutting-edge, and three-jointed palp. First maxillæ normal with rather slender two-jointed palp. Second maxillæ with oblong subequal lobes. Maxillipeds with enormously developed palp; outer plate devoid of marginal spines, and reaching but little beyond the first joint of the palp. Side plates very small; gnathopods similar, nearly equal in size, with large elongated hands, the palms of which include the larger part of the posterior margin. First two pairs of peræo-

^a From the Latin words *gracilis*, slender, and *pes*, foot.

pods very slender, with straight dactyls. Last three pairs of peræopods greatly elongated; basal joints narrow, dactyls long and straight. Pleopods large. First two pairs of uropods with narrow attenuated rami; third pair with the rami broader and more flattened. Telson long, narrow, and emarginate.

Type.—*G. natator*, new species.

I have placed this genus in the family Calliopiidæ, although it forms a somewhat aberrant member of that group. The peduncles of the antennæ and the palps of the maxillipeds are much more elongated than in the other genera. The genus *Haliragoides* approaches it in having small side plates and long slender peræopods with very narrow dactyls, but in other respects it is quite different.

GRACILIPES NATATOR, new species.

Antennæ very slender, about as long as the body, and of subequal length. Peduncle of first antennæ elongate, about half the length

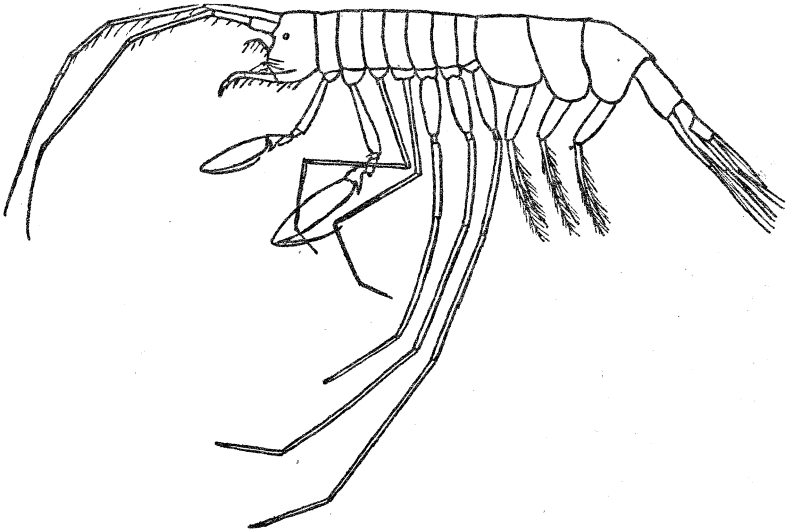


FIG. 32.—GRACILIPES NATATOR.

of the body, the second joint nearly a half longer than the first and over twice the length of the third; flagellum about equal to the peduncle, the elongate segments furnished with minute setæ less than half the diameter of the segments in length. Second antennæ with the peduncle exceeding that of the first, the last joint very slender and somewhat longer than the flagellum and markedly longer than the preceding joint. Along the lower and outer side of the first antennæ, and to a greater extent along the upper side of the second pair, are numerous cup-like organs resembling calceolæ both on the peduncles and the flagella.

Mandibles with well-developed molar, which is margined with slightly curved spines; spine row with four large setae on each mandible, with a small plumose seta at the base of each spine; secondary

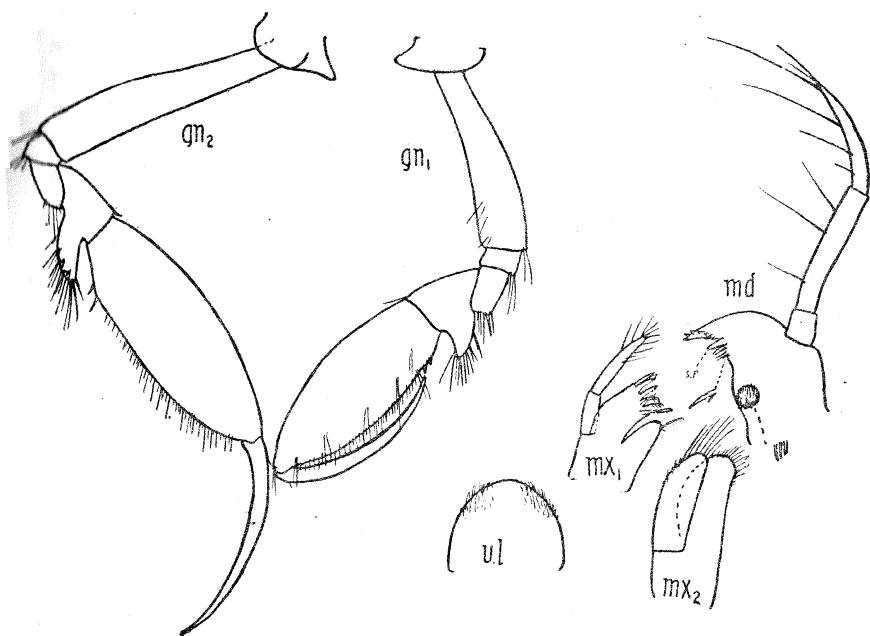


FIG. 33.—GRACILIPES NATATOR. *gn*₁, FIRST GNATHOPOD; *gn*₂, SECOND GNATHOPOD; *md*, MANDIBLE; *mx*₁, FIRST MAXILLA; *mx*₂, SECOND MAXILLA; *ul*, UPPER LIP.

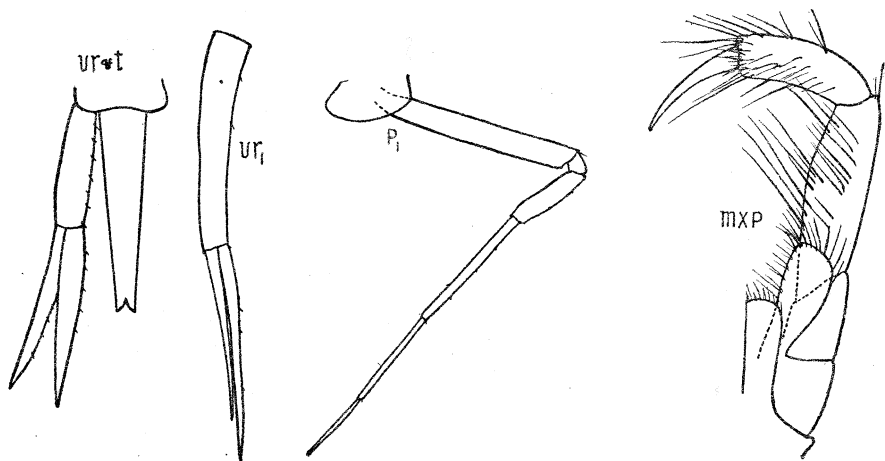


FIG. 34.—GRACILIPES NATATOR. *mxp*, MAXILLIPED; *p*₁, FIRST PEREPOD; *ur* AND *t*, UROPOD AND TELSON; *ur*₁, FIRST UROPOD.

plate well developed and dentate on left mandible, small and narrow on the right; last joint of palp curved, about three-fourths the length of preceding joint, and bearing a few large setae. Inner plate of

maxillæ, with a single seta near the tip and a second smaller seta near the first; outer plate with nine spines; first joint of palp about twice as long as wide; second twice the length of the first. Second maxillæ with large setæ only around the tips of the plates. Maxillipeds with two spines and a few stout setæ on end of inner plate; outer plate reaching beyond the first joint of the very large palp; claw of the palp long, narrow, and devoid of setæ.

Side plates very small, broader than deep, the first two produced at the antero-inferior angle. First gnathopods a little shorter than the second; carpus with a prominent posterior lobe; hand narrowly oval, palm extending over most of the posterior margin, defined above by a prominent spine, above which is a second smaller spine near which on the inner surface of the hand is a cluster of five or six spines. Second gnathopods with the posterior lobe of the carpus longer and more narrow than the first pair; hand much like that of the first, with two spines above the end of the palm, but having only two spines on the inner surface near the upper marginal spine.

First and second peræopods very slender, longer than the gnathopods, armed with but few minute spines; dactyls very slender and straight. Last three pairs of peræopods very long and slender, with narrow basal joints; dactyls very long, slender, straight.

Second and third abdominal segments with a dorsal carina, which ends posteriorly in a spine; fourth segment with a dorsal carina but no spine.

Uropods extending backward to nearly the same point; outer rami a little shorter than the inner; first and second uropods very sparsely armed with minute spinules, the rami very slender and attenuate; terminal uropods with lanceolate rami, which are broader and more flattened than in the preceding pairs, and armed with several short spines on the inner margin. Telson long and narrow, evenly tapering to the notched tip which reaches the middle of the rami of the posterior uropods.

Length.—11 mm.; length of posterior peræopods 11 mm.

Locality.—Station 4397, off Santa Catalina Islands, 2196–2228 fathoms, one female; Station 4427, of Santa Cruz Island, 447–510 fathoms, one female, type.

Type.—Cat. No. 38551, U.S.N.M.

GRACILIPES DISTINCTA, new species.

Blind. Rostrum small. First antennæ somewhat shorter than the second; the first joint of the elongate peduncle twice as thick as the second and nearly as long; third joint about two-thirds the length of the second; flagellum about two-thirds the length of the peduncle. Second antennæ with very long and slender peduncle, much exceeding that of the first pair; flagellum shorter than the peduncle. Both antennæ devoid of calceolæ.

Mandibles closely resembling those of the preceding species, but having the last joint of the palp longer than the two preceding ones combined. Inner lobes of lower lip small but distinct, and rounded in front like the outer ones; posterior angles moderately produced and rounded. First maxillæ resembling very closely those of the preceding species, the inner plate with a single large seta; outer plate with nine spines; palp with the first joint about twice as long as wide. Second maxillæ with the plates oblong, subequal, and setose only around the distal margin. Maxillipeds with the inner plates armed distally with three spines; outer plate relatively longer and more narrowed distally than in *natator*, and reaching the posterior third of the second joint of the very large palp.

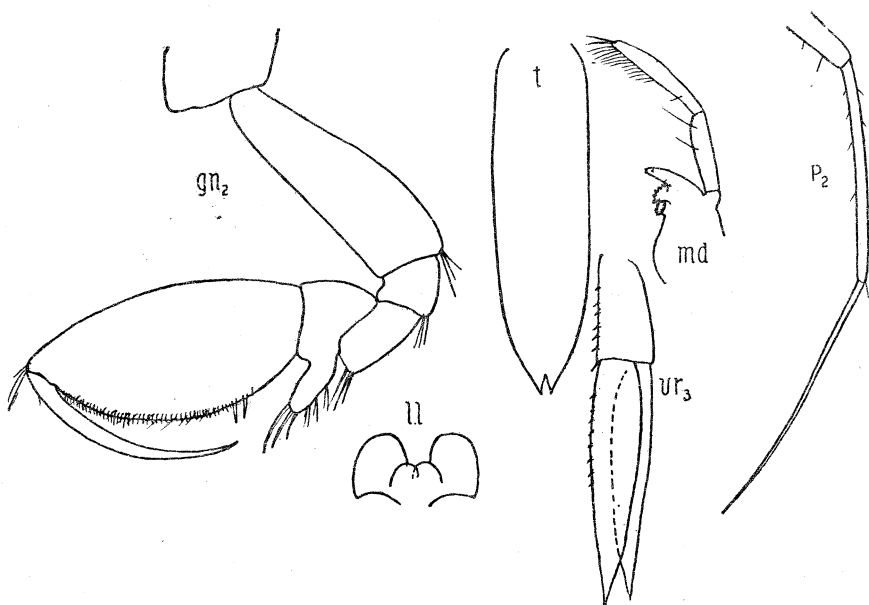


FIG. 35.—*GRACILIPES DISTINCTA*, FEMALE. *gn*₂, SECOND GNATHOPOD; *ll*, LOWER LIP; *md*, MANDIBLE; *p*₂, SECOND PEREOPOD; *t*, TELSON; *ur*₃, THIRD UROPOD.

First gnathopods with the side plate rounded in front; basal joint with a prominence bearing several long setæ on the inner surface near the antero-inferior angle; carpus with a narrow setose posterior lobe; hand large, narrowly oval, palm extending over most of the posterior margin, furnished with stout setæ and having three spines above the upper end, which diminish in size toward the base of the hands; inner surface near these spines armed with a small group of spines. Second gnathopods a little larger than the first; side plate not produced anteriorly; basal joint with a setose prominence near the lower end, as in the first pair; carpus with a prominent posterior lobe which is longer and narrower than in the first gnathopods; hand

narrowly oval, palm relatively a little shorter than in the first pair, furnished with two marginal spines at the upper end, near which is a pair of stout spines on the inner surface.

Second pair of peræopods (the first pair broken in specimen) very long and slender, the basal joint armed behind with about ten spines; dactyl very slender, tapering, slightly curved and much elongated, exceeding the length of the propodus, which is also long. Basal joints of the posterior pairs of peræopods narrow; merus narrow and elongated. Marsupial lamellæ very large.

First three abdominal segments with a dorsal carina which ends posteriorly in a spine; infero-lateral angles of second and third segments broadly rounded. First uropods with flattened lanceolate rami, which are broader than in the preceding species and furnished like the somewhat longer peduncle with several spines; terminal uropods with flattened subequal lanceolate rami which are armed on the outer margin with several spines. Telson long, broader than in the preceding species, the sides nearly parallel up to the posterior third, whence they taper to the emarginate tip.

Length.—8 mm.

Locality.—A single female specimen from Station 4429, off Santa Cruz Island, 506–680 fathoms.

Type.—Cat. No. 38552, U.S.N.M.

In the single specimen of this species in the collection the last three pairs of peræopods were broken off at the end of the merus. The species closely resembles the preceding in many characters, but the maxillipeds have a longer and more pointed outer plate, the gnathopods have broader hands and the coxal plates not produced anteriorly, the second peræopods have a longer and more curved dactyl; the first and second uropods have broader rami armed with stouter spines, and the telson is broader and otherwise different in shape.

Family PLEUSTIDÆ.

NEOPLEUSTES OCULATUS, new species.

Rostrum short; lateral lobe of head triangular, rounded at tip, lower angle of head produced into an acute, triangular lobe. Eyes fairly large. First antennæ over half the length of the body; first joint as long as the next two; third about half the length of second. Second antennæ about two-thirds the length of the first; last two joints of peduncle subequal.

Upper lip with unequal rounded lobes. Mandibles with rudimentary molar tubercle, cutting edge broad, with many teeth; accessory plate on one mandible broad and furnished with many teeth; third joint of palp armed with three or four spinelike bristles at tip and with about eight shorter ones on inner margin. First maxillæ

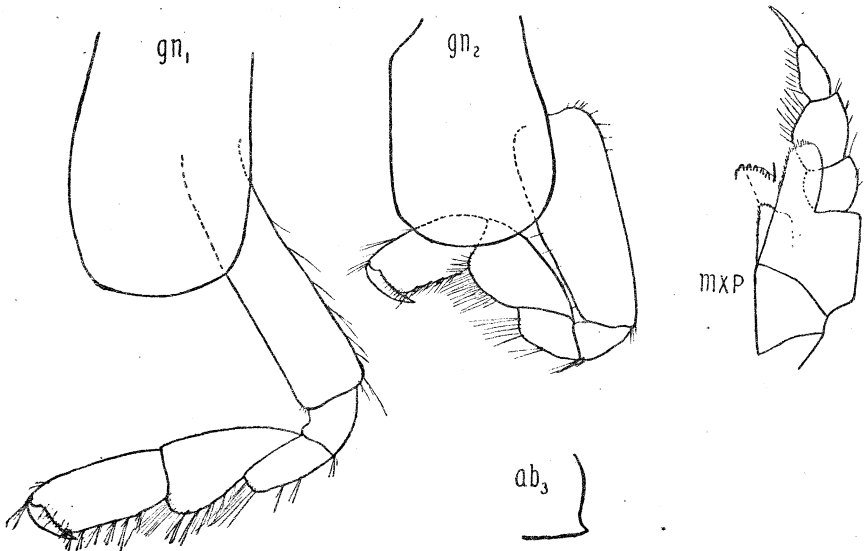


FIG. 36.—NEOPLEUSTES OCOLATUS, FEMALE. *ab*₃, THIRD SEGMENT OF THE ABDOMEN; *gn*₁, FIRST GNATHOPOD; *gn*₂, SECOND GNATHOPOD; *m*xp, MAXILLIPED.

with a minute seta on rudimentary inner lobe; palp with seven spines on distal margin. Lobes of second maxillæ subequal, setose around rounded ends, a single long plumose seta on inner margin of inner plate. Outer plate of maxillipeds reaching but little beyond first joint of palp, armed with about eight slender spines on distal end and furnished with short setæ, but no spines on inner margin.

Gnathopods subequal, not strongly developed; hands more or less rectangular with slightly oblique palm. Segments of pleon as well as peræon smooth and devoid of spines or teeth. Uropods extending back to about the same distance, rami subequal in first pair; in the last two pairs the outer ramus is about two-thirds the length of the inner one. Telson oblong, rounded at tip, with a keel on ventral side at base.

Length.—11 mm.

Locality.—Station 4457, Monterey Bay, 40–46 fathoms, three specimens.

Type.—Cat. No. 38553, U.S.N.M.

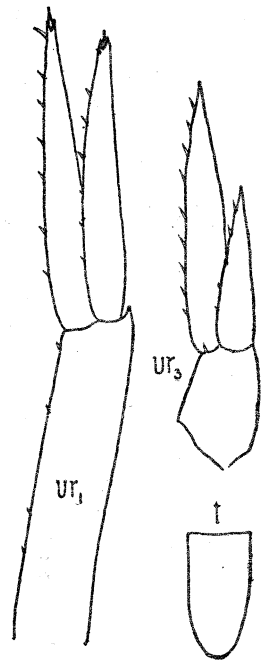


FIG. 37.—NEOPLEUSTES OCOLATUS, FEMALE. *t*, TELSON; *ur*₁, FIRST UROPODA; *ur*₃, THIRD UROPOD.

This species differs from most species of the genus in having no dorsal spines. From *N. brevicornis* (Sars) it differs in its longer antennæ, more rectangular hands, and more oblong telson; from

N. assimilis (Sars) it differs in the more rectangular hands on the gnathopods; from *N. bairdi* (Boeck) it differs in the shape of the hands which are oval in that species as well as in the size of the hands which are relatively much smaller.*

Genus ACANTHOPLEUSTES,^a new.

Rostrum minute or absent. First antennæ elongate, with small accessory flagellum. Upper lip evenly rounded, entire. Mandibles with elongated, narrow three-jointed palp situated nearly opposite the well-developed molar tubercle; secondary plate on both mandibles. Lower lip with inner lobes fairly well developed. First maxillæ short, the inner plate broad, distally rounded and armed with a few plumose setæ; outer plate but little longer than the inner and armed with branched spines; palp two-jointed, the distal margin armed with stout spines. Second maxillæ with nearly equal oblong setose lobes. Maxillipeds with inner plates small, armed distally with three spine teeth; outer plates small, not reaching beyond middle of antepenultimate joint of palp, devoid of teeth, but furnished distally and along inner margin with long ciliated spine-like setæ; last joint of large palp a strong claw.

Gnathopods similar, fairly well developed, subchelate, side plates two to four pointed below. Last three peræopods rather long, with narrow basal joints. First three abdominal and some of the posterior thoracic segments produced posteriorly into teeth or spines. Rami of uropods lanceolate, those of the last pair broader than the others. Telson small, entire or slightly emarginate, and furnished with a prominent keel on the lower side.

Type.—*A. annectens*, new species.

This genus does not fall strictly within the limits of any of the families of Gammaridea, as they are defined by Sars or Stebbing. It is very close to the Paramphithoidæ as limited by Sars, but the antennæ have a secondary flagellum, and the upper lip is entire. Stebbing defines the Paramphithoidæ differently from Sars, including, besides the genus *Paramphthoe*, the genera which Sars places in the family Epimeridæ, and making out of several other genera which Sars placed in the family Paramphithoidæ, the new family Pleustidæ. It could be placed in the Calliopiidæ without doing violence to the definition of that family as given by Stebbing. Sars has commented on the resemblance of the Calliopiidæ and Paramphithoidæ and the present genus seems to occupy a position in some respects intermediate between these two families. The rudimentary rostrum, the presence of structures resembling calceolæ on the antennæ and the entire upper lip, are features more in accord with the Calliopiidæ, while the spiny dorsum, the pointed coxal plates, the ventrally keeled telson, the nar-

^aFrom the Greek words ἄκανθα, spine, and *Pleustes*, a related genus of amphipods.

row basal joints of the peræopods, and the form of the maxillæ and maxillipeds are more like those of the Paramphithoidæ of Sars and the Pleustidæ of Stebbing.

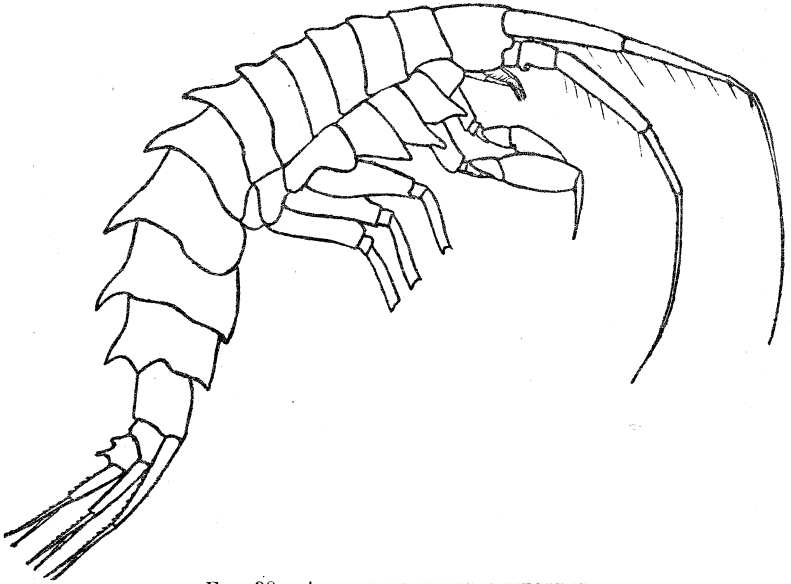


FIG. 38.—*ACANTHOPLEUSTES ANNECTENS*.

ACANTHOPLEUSTES ANNECTENS, new species.

Eyes absent. Lateral lobes of head truncated in front. First and second antennæ subequal and over half the length of the body;

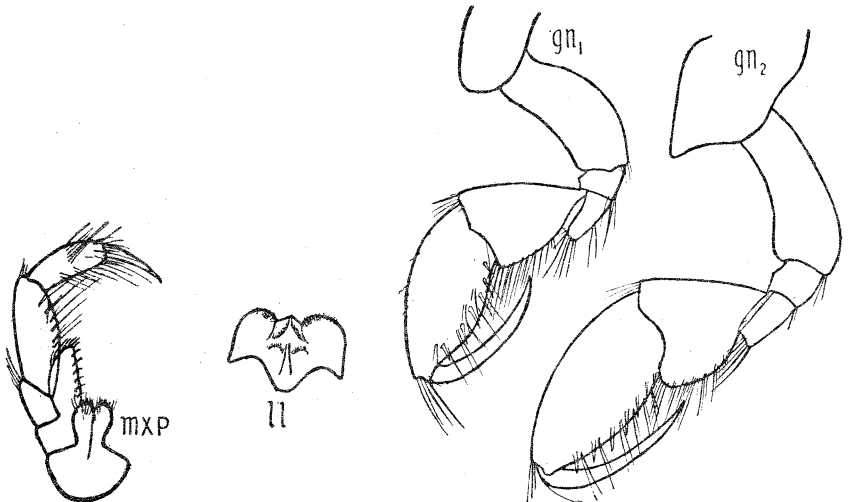


FIG. 39.—*ACANTHOPLEUSTES ANNECTENS*. *gn*₁, FIRST GNATHOPOD; *gn*₂, SECOND GNATHOPOD; *ll*, LOWER LIP; *mXP*, MAXILLIPED.

peduncles elongated and about equalling the flagelia, those of the first pair almost as long as those of the second and having the first

and second joints of subequal length and about four times as long as the third; secondary flagellum consisting of one elongate segment and furnished with a few spinules. Second antennæ with the last basal joint about two-thirds length of preceding one; flagella of both pairs with structures resembling calceolæ.

Last two thoracic segments produced posteriorly in the dorsal side into a large acute tooth similar to those on the first three segments of the abdomen. Last segment of the abdomen with a posterior acute tooth in front of which is a prominence of variable size. Inferolateral angle of second and third abdominal segments acute. First pair of side plates broadly rounded below, the following three pairs with the infero-anterior angle produced and acute; the third pair longer and more narrowly produced than the others.

First and second gnathopods with narrowly ovate hands of similar form; dactyl long and closing against most of the length of the evenly curved posterior margins which is armed with a series of strong spines. Peraeopods of nearly equal length; basal joints narrow, dactyls rather long, half the length of the narrow propodi, smooth. Uropods reaching back to about the same point; peduncles of first and second pairs reaching

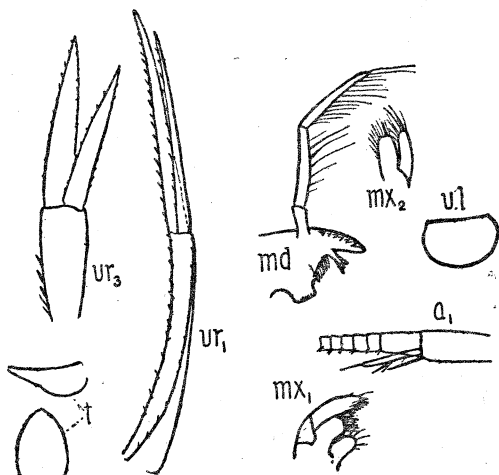


FIG. 40.—ACANTHOPLEUSTES ANNECTENS. *a*₁, FIRST ANTENNA; *md*, MANDIBLE; *mx*₁, FIRST MAXILLA; *mx*₂, SECOND MAXILLA; *t*, TELSON; *ul*, UPPER LIP; *ur*₁, FIRST UROPODA; *ur*₃, THIRD UROPOD.

back to the same point, those of the third extending a little farther; rami slender, armed on both margins like the peduncles with numerous short spines, the outer ramus slightly shorter than the inner. Telson ovate, upper surface concave; a keel-like prominence on lower side of base.

Length.—14 mm.

Localities.—Station 4407, Santa Catalina Islands, 334–600 fathoms, type, 10 + specimens; station 4415, Santa Barbara Island, 302–638 fathoms.

Type.—Cat. No. 38554, U.S.N.M.

Family STILIPEDIDÆ, new.

Antennæ devoid of accessory flagellum. Mandible with three-jointed palp, molar tubercle small or absent. Lower lip with widely diverging lobes. First maxillæ with narrow inner plate; outer plate

very broad and armed distally with numerous spines; palp two-jointed, with widely expanded second joint. Maxillipeds with well-developed inner and outer plates, the latter widely separated and diverging distally; palp four-jointed and directed obliquely. First and second gnathopods simple or subchelate. Last pair of peræopods with a straight, elongated dactyl. Uropods biramous, with flattened, mostly lanceolate, rami. Telson short, entire or notched.

Genus *STILIPES*,^a new.

Antennæ with short peduncle and well developed flagellum. Mandibles with broad cutting edge. Second maxillæ with broad rounded setose lobes. Maxillipeds devoid of prominent spines, joints of palp narrow, the terminal one unguiform. Anterior pairs of side plates large; the first three diminishing in width but subequal in length; fourth pair shorter than the third and more or less pointed below. Gnathopods moderately developed; carpus large; hands rather small, simple or more or less subchelate. First two pairs of peræopods subequal, with short, curved dactyls. Fourth peræopods with an elongated propodus and short styliiform dactyl. Last peræopods with the propodus relatively shorter and with the dactyl much larger. Rami of terminal uropods broader than in the others. Telson short and apically emarginate.

Type.—*S. distincta*, new species.

STILIPES DISTINCTA, new species.

Eyes absent, or at least not visible in alcoholic specimen. Rostrum short. First antennæ with very short peduncle; flagellum rather stout with the joints on the proximal portion furnished below with numerous setæ, which decrease in length and in number toward the more distal joints. Second antennæ with the peduncle short, but much longer than in the first pair, and having its last joint a half longer than the preceding; flagellum nearly reaching the middle of the body and furnished only with very minute setæ.

Mandibles stout, with broad cutting edge which is smooth on the right mandible but furnished with numerous regular, sharp, up-turned teeth on the left; molar not evident; third joint of palp about half the length of the second. Lower lip with widely separated acute lobes, and the posterior angles produced into a narrow acute lobe. First maxillæ with the inner plate narrow and furnished with setæ only around the distal end; the broad distal end of the outer plate is armed with about twenty-five uniform smooth spines which are curved at the distal end; the broadly expanded terminal joint of the palp is furnished on the distal margin with low, blunt teeth,

^a From the Latin words *stilus*, style, and *pes*, foot.

which decrease in size toward the median edge, where there occurs a single small spine; the rounded outer angle is more or less serrate and furnished with slender spines. The plates of the second maxilla

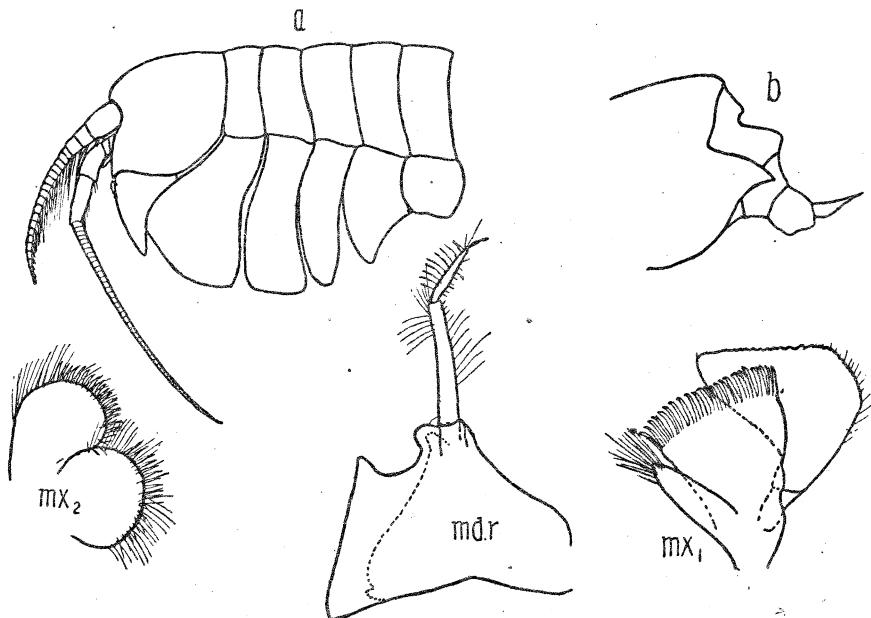


FIG. 41.—STILIPES DISTINCTA. *a*, ANTERIOR PART OF BODY; *b*, END OF ABDOMEN; *md.r*, RIGHT MANDIBLE; *mx₁*, FIRST MAXILLA; *mx₂*, SECOND MAXILLA.

are nearly round, subequal in size, and furnished with numerous setae, among which are several strong, slightly curved spines. The maxillipeds have the inner plates nearly rectangular with the transverse distal margin setose; outer plates oval, setose, but devoid of spines; palp with the first and third joints of subequal length, and a little shorter than the second; fourth joint short and claw-like.

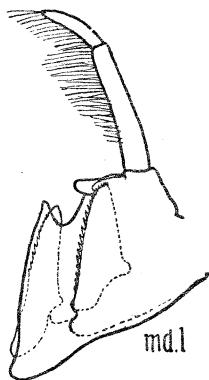


FIG. 42.—STILIPES DISTINCTA, LEFT MANDIBLE.

First gnathopods with the carpus longer and much broader than the hand, which is oblong, densely setose and simple, or very imperfectly subchelate. Second gnathopods longer than the first; carpus elongate, hand narrow, distally tapering, much longer than in the first pair and simple. First and second peraeopods, with the exception of the coxal plates, similar in size and shape; posterior margins armed with numerous short stout spines, dactyls short and curved. The last pairs of peraeopods are elongate, the basal joint is produced distally into a rounded lobe, the dactyls are straight; those of the last pair much elongate and armed with several spinules.

Fourth abdominal segment with a dorsal sinus behind which is a triangular prominence; infero-lateral angle of the second and third segments acute; pleopods long. Uropods extending back to nearly the same point, the first pair slightly exceeding the others, rami flattened, armed on both margins with numerous short spines, narrowly lanceolate in the first two pairs, broader in the third; nearly equal in the first and third pairs, but in the second the outer ramus is about one-fifth the shorter. Telson short, concave above, with a broad rounded emargination at the tip.

Length.—9 mm.

Localities.—Station 4423, off San Nicolas Island, 216–339 fathoms.

Type.—Cat. No. 38555, U.S.N.M.

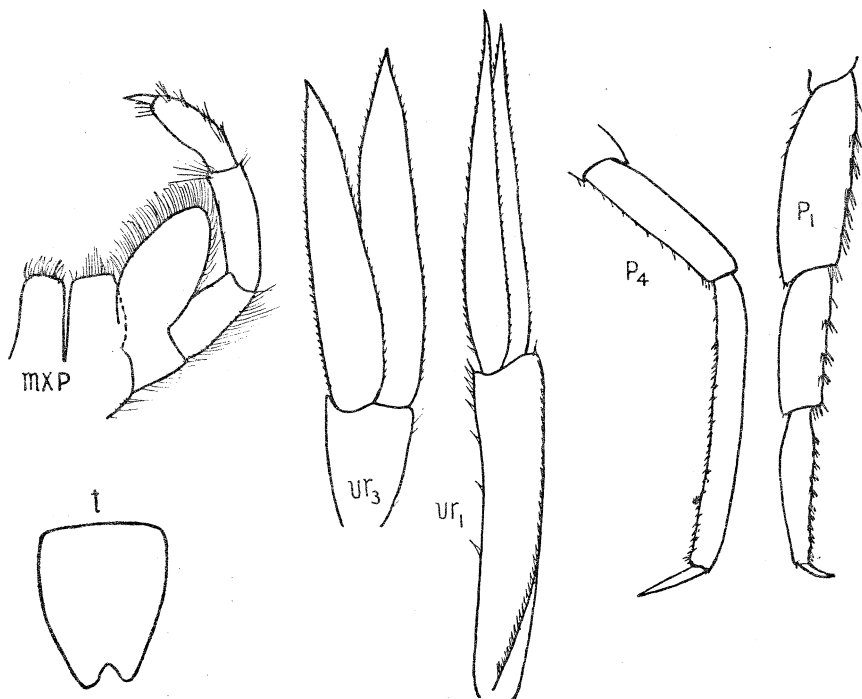


FIG. 43.—*STILIPES DISTINCTA*. *mXP*, MAXILLIPED; *p*₁, FIRST PEREPOD; *p*₄, FOURTH PEREPOD; *t*, TELSON; *u*₁, FIRST UROPOD; *u*₃, THIRD UROPOD.

I regret that but a single specimen of this species, and that a somewhat imperfect one, occurs in the collection. The ends of several of the legs were broken off and the lower lip was somewhat mutilated in removing it. The species is not closely allied to any of the recognized families of amphipods. The posterior pereopods resemble those of the *Cedicerotidae*, but the mouth parts are markedly different. The broad outer plate of the first maxillæ with its large number of distal spines and the greatly expanded palp; the broad, rounded plates of the second maxillæ; and the diverging outer plates and

palpi of the maxillipeds are characters seldom met with and never in combination in other groups. The mandibles also are unusual in having a very broad cutting edge and in having a number of small

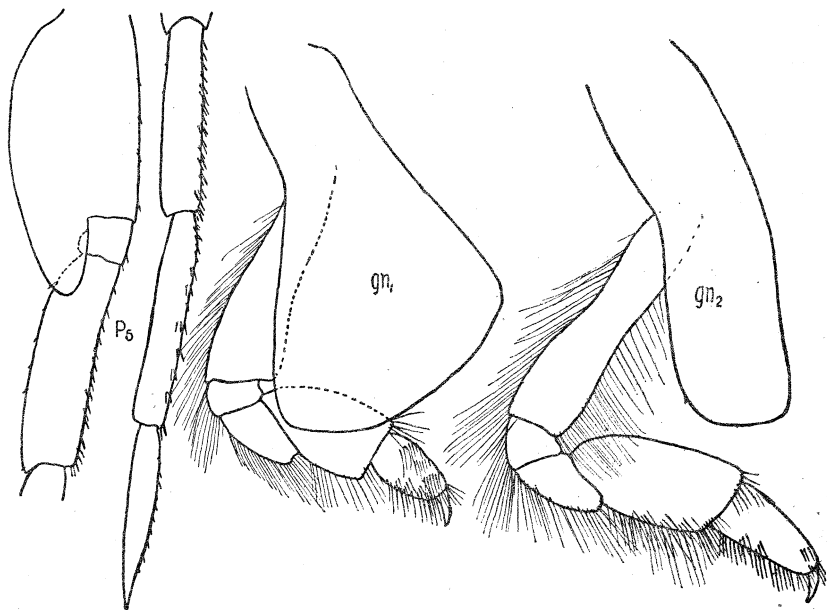


FIG. 44.—*STILIPES DISTINCTA*. gn_1 , FIRST GNATHOPOD; gn_2 , SECOND GNATHOPOD; P_5 , FIFTH PEREPOD.

acute teeth only on one side. Both of the first antennæ were broken off and the length of these appendages could not be determined.

Family GAMMARIDÆ.

MÆRA DUBIA Calman.

A single specimen from Station 4523, Monterey Bay, 75–108 fathoms.

MÆRA SPINICAUDA, new species.

Eyes oval or round. First antennæ nearly half the length of the body, the first joint about three-fourths the length of the second; flagellum not as long as peduncle; secondary flagellum long, composed of eight to ten joints. Second antennæ about two-thirds as long as the first; last joint of the peduncle about two-thirds the length of the preceding one; flagellum about as long as the penultimate joint of the peduncle.

First four side plates about as deep as wide, the first produced forward into an acute angle. Second gnathopods large, unequal; the larger one with the carpus broader than long, with a narrow, setose

posterior lobe; hand longer than the preceding joints combined, oblong, the palm very oblique and extending beyond the middle of the posterior margin, defined above by a prominence bearing a pair of stout spines, and bearing below the middle two broad lobes armed with spines and separated by a narrow sinus; the stout curved finger bears a small rounded prominence near the base of the inner margin; the tip fits into a concavity at one side of the upper end of the palm; a couple of large spines on the edges of this concavity and a row of short spines extending distally from it along the inner surface of the hand. The smaller gnathopod has the carpus triangular, about as long as wide, with a broadly rounded posterior lobe; hand with

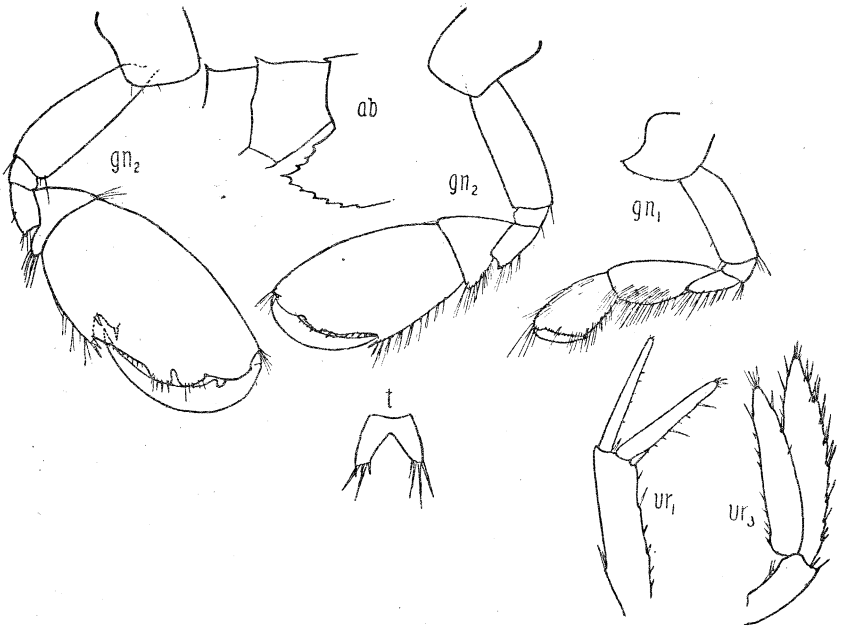


FIG. 45.—*MERA SPINICAUDA*. *ab*, SEGMENT OF THE ABDOMEN; *gn*₁, FIRST GNATHOPOD; *gn*₂, SECOND GNATHOPODS OF THE RIGHT AND LEFT SIDES; *t*, TELSON; *ur*₁, FIRST UROPOD; *ur*₃, THIRD UROPOD.

the palm less oblique and much less uneven than in the larger gnathopods, the lobes on the lower half being represented only by a slight prominence; the finger has a low prominence on the inner margin near the base, and the tip fits into a sinus near the spiniferous prominence at the upper end of the palm; this sinus is not nearly so large as in the larger hand but it is furnished with two large spines on its upper side on the inner surface of the hand.

First two peraeopods slender, the dactyl about a third the length of the propodus. Basal joints of the last three peraeopods about twice as long; merus expanded, especially in the last two pairs; dactyls about a third the length of the propodi. First five abdominal seg-

ments with a dorsal spine at the posterior end, those on the fourth and fifth segments larger and more upturned than the others. In-fero-lateral angles of first two abdominal segments with a small tooth, those of the third segment produced and armed with several teeth on the lower and posterior margins. Third uropods large, with broad flattened nearly equal rami, with spinose margins. Telson with a broadly triangular cleft, the lobes widely diverging, and armed with a cluster of four or five spines at the tip, some of which are very long.

Length.—12 mm.

Locality.—Station 4417, Santa Barbara Island, 29 fathoms; Station 4420, off San Nicolas Island, 32–33 fathoms, female type; Station 4431, off Santa Rosa Island, 38–45 fathoms.

Type.—Cat. No. 38556, U.S.N.M.

Family PHOTIDÆ.

EURYSTHEUS DENTATUS, new species.

Eyes rather small, round, on the projecting lateral lobes of the head. First antennæ over half the length of the body and rather longer than the second; first joint of the peduncle nearly as long as the second; third joint about three-fifths the length of the second; flagellum a little shorter than the peduncle; secondary flagellum five-jointed. Second antennæ with the last two joints of the peduncle subequal; flagellum larger than the last basal joint but shorter than the last two.

Mandibles with the last joint of the palp nearly as long as the preceding and slightly wider and furnished distally with numerous very long setæ. Lower lip with acute narrow posterior lobes. First maxillæ with the inner plate broad, the narrow tip turned inward and furnished with four plumose setæ; outer margin with about fourteen plumose setæ; outer plate with ten spines; palp with about nine spines on distal margin of elongated second joint. Second maxillæ devoid of setæ on inner margin of inner plate, but having an oblique row of setæ extending across the surface from the base of the inner side. Maxillipeds with the terminal joint obtuse, about twice as long as wide and scarcely half the length of the preceding one.

First four pairs of side plates about as deep as broad, the first produced forward. First gnathopods rather stout, smaller than the second pair; hand about as long as carpus, about a half longer than broad; the palm at an angle of about 45° to long axis, slightly longer than the posterior margin, and having a stout spine at the end. In the second gnathopods the hand is relatively longer, considerably exceeding the carpus, the posterior margin longer than the palm, which has a large spine near the end. First and second peræopods

rather stout, second, fourth, and fifth joints rather broad, propodus and dactyl rather stout.

Infero-posterior angle of the third abdominal segment almost a right angle but produced into a small triangular tooth. Last three segments with a prominent dorsal tooth posteriorly on either side of the middle. First and second uropods extending back to about the same point but exceeding the third. Peduncle of first uropods somewhat shorter than the rami and having a large terminal spine, extending beneath the rami to about their posterior third. Peduncle

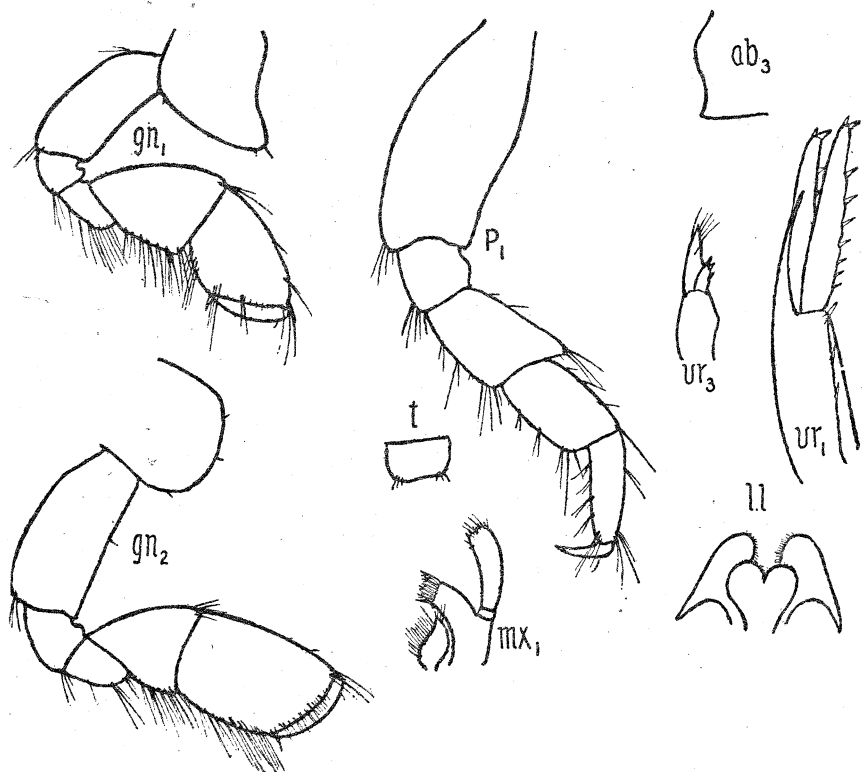


FIG. 46.—EURYSTHEUS DENTATUS. *ab₃*, THIRD SEGMENT OF THE ABDOMEN; *gn₁*, FIRST GNATHOPOD; *gn₂*, SECOND GNATHOPOD; *ll*, LOWER LIP; *mx₁*, FIRST MAXILLA; *p₁*, FIRST PEREPOD; *t*, TELSON; *ur₁*, FIRST UROPOD; *ur₃*, THIRD UROPOD.

of second uropods nearly as long as the rami and having no large terminal spine. In the small terminal uropods the inner ramus is about half the length of the outer which is nearly as long as the peduncle. Telson broader than long and distally truncated.

Length.—About 11 mm.

Locality.—A single female specimen from Station 4268, Afognak Bay, Afognak Island, Alaska, 16–17½ fathoms.

Type.—Cat. No. 38557, U.S.N.M.

PODOCEROPSIS NITIDA (Stimpson).

A single specimen from Station 4278, Alitak Bay, Kadiak Island, Alaska, 22-25 fathoms.

PHOTIS REINHARDI Krøyer.

Three specimens associated with *Caprella californica* from Station 4519, Monterey Bay. 27-35 fathoms.

Family COROPHIIDÆ.

ERICHTHONIUS HUNTERI (Bate).

A specimen from Station 4302, off Shakan, Sumner Strait, Alaska, 169-212 fathoms.

Legion CAPRELLIDEA.

Family CAPRELLIDÆ.

CAPRELLA CALIFORNICA Stimpson.

Numerous specimens from Station 4519, Monterey Bay, 27-35 fathoms.