To John Gantt
with kindest regards
Fenner A. Chace, Jr.
Chace, JR., 1937

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The Templeton Crocker Expedition. VII. Caridean Decapod Crustacea from the Gulf of California and the West Coast of Lower California.[1]

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(Text-figures 1-9).

[Note: This is the seventh of a series of papers dealing with the specimens collected on the Twenty-fourth or Templeton Crocker Expedition of the Department of Tropical Research of the New York Zoological Society; William Beebe, Director. For data on dredges, localities, dates, etc., concerning the capture of the specimens treated in this paper, refer to the present volume of *Zoologica,* No. 2, pp. 33 to 46.]

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[1] Contribution No. 526, Department of Tropical Research, New York Zoological Society.

INTRODUCTION.

The caridean prawns collected by the Templeton Crocker Expedition belong to 29 species, of which nine were apparently heretofore undescribed and one is the type of a new genus. Worthy of particular mention is the remarkable fact that, of the remaining 20 known species, nine had not been previously recorded from the region visited by the expedition. Of these nine forms, four were entirely unknown to the fauna of the Pacific coast of America; two of the four were described from the tropical Atlantic and the other two are Indo-Pacific varieties. Inasmuch as all three species of Hippolytidae in the collection, including two undescribed species, and one species of Palaemonidae, were well represented in the stomach contents of specimens of the American Eared Grebe (*Colymbus nigricollis californicus* (Heermann)), the suggestion might be advanced that the habits of such diving birds would become of real interest not only to the ornithologist but to the student of marine invertebrates as well if they could be trained to collect such animals much as are the cormorants of oriental fishermen.

The color notes were made in the field by members of the expedition.

All catalogue numbers refer to specimens in the collections of the Department of Tropical Research of the New York Zoological Society, except those preceded by the letters M.C.Z; the latter group denotes specimens in the Museum of Comparative Zoology.

PASIPHAEIDAE.

Pasiphaea emarginata Rathbun.

Pasiphaea emarginata Rathbun, M.J., *Proc. U. S. Nat. Mus.*, vol. 24, p. 905, 1902.

Pasiphaea emarginata Schmitt, W.L., *Univ. California Pub. Zool.*, vol. 23, p. 30, fig. 15, 1921.

General Range: From off Santa Barbara Islands and Santa Barbara Channel to off San Diego, California, and off Concepcion Bay, Gulf of California, from 216 to 857 fathoms.

Local Distribution: A total of three specimens was taken 23 miles east by south of Tortuga Island (Station 139) and 13 and 20 miles northeast of San Ildefonso Islands (Station 148) in 500 fathoms.

Sex and Size: The three males have a total length of 39, 45 and 64 mm.; the carapace lengths are respectively 15.2, 18 and 26.4 mm.

Color in Life: Translucent white speckled with fine chromatophores,

scarlet red by Ridgway's Color Standards. The red is most concentrated on the sides of the carapace, on the keel of the last three abdominal segments and on all the appendages. Eye dark brown.

Remarks: The *Zaca* specimens were taken very near the point off Concepcion Bay which is the type locality of this species.

Material: *Station* 139: T-4 (1 ♂). *Station* 148: T-4 (1 ♂), T-8 (1 ♂). Cat. Nos. 36,931, 36,932.

Leptochela serratorbita Bate ?

Leptochela serratorbita Bate, C.S. *Challenger Rept., Zool.*, vol. 24, p. 859, pl. 134, fig. 1, 1888.

Leptochela serratorbita Schmitt, W.L., *Sci. Surv. Porto Rico and Virgin Ids.*, vol. 15, pt. 2, p. 134, 1935.

General Range: Key West, Florida, to St. Thomas, to a depth of 23 fathoms.

Local Distribution: A total of 99 specimens was taken at San Lucas Harbor (Station 135) both at the surface beneath a light and dredged in 8 to 16 fathoms on sandy bottoms.

Sex and Size: The mature female taken on March 29 is ovigerous; it is about 17 mm. long, the carapace measuring 4.1 mm. The female taken with the dredge, which, from the condition of the abdomen, had evidently liberated eggs but a short time before, is of about the same length with a carapace length of 3.9 mm. The young are from 4.9 to 7.7 mm. long.

Remarks: Although these specimens agree very well with Miss Rathbun's description (*Bull. U. S. Fish. Comm.* for 1900, vol. 20, pt. 2, p. 127, 1901), a direct comparison of Atlantic and Pacific specimens might possibly reveal differences of taxonomic importance. The young specimens in the present material lack the row of spines on the orbital margin, but this is probably attributable to their age.

I have had the opportunity to examine two males and a female of this species loaned by the American Museum of Natural History which were taken near Topolobampo, Mexico, Lat. 25° 30′ N., Long. 109° 12′ W. on November 17, 1935.

Material: *Station* 135: Surface night light, March 29 (1 ♀, 97 young), D-1 (1 ♀). Cat. Nos. 36,933, 36,934.

ACANTHEPHYRIDAE.

Acanthephyra curtirostris Wood-Mason.

Acanthephyra curtirostris Wood-Mason, J., *Ann. Mag. Nat. Hist.*, ser. 6 vol. 7, p. 195, 1891.

Acanthephyra curtirostris Balss, H., *Wiss. Ergebn. Deutschen Tiefsee-Exped.*, vol. 20, no. 5, p. 261, text-fig. 30 (mandible), 1925.

General Range: Off the east coast of Africa, Arabian Sea, Bay of Bengal, Laccadive Sea, Andaman Sea, Malay Archipelago, Philippine Islands, south of Japan, Hawaiian Islands and off the west coast of America from San Diego to Peru. There is also a specimen in the U. S. National Museum, which I refer to this species, that was taken in the equatorial Atlantic off British Guiana. *A. curtirostris* has been taken in depths ranging from 364 to 2,730 fathoms.

Local Distribution: A total of 26 specimens was taken from nine miles south of Santa Margarita Island (Station 133), 23 miles east by south of Tortuga Island (Station 139), four and one half miles southwest of Mazatlan (Station 154) and 34 miles east by south of Arena Point (Station 159).

Sex and Size: Three of the females are ovigerous and range in length from 99 to 102 mm. (carapace, 23.7 to 24 mm.). The non-ovigerous females are from 70 to over 86 mm. long (carapace, 17 to 22 mm.), the two males are 73 and 84 mm. long (carapace, 17.2 to 20.2 mm.) and the young vary from 14 to 40 mm. long (carapace, 3.5 to 9.8 mm.).

Material: *Station* 133: T-3 (1 ♂, 2 young). *Station* 139: T-4 (4 ♀, 1 young). *Station* 154: T-4 (2 young). *Station* 159: T-3 (1 ♂, 1 ♀, 14 young). Cat. Nos. 36,935 to 36,939, incl. Two females from *Station* 139 and four young specimens from *Station* 159 are in the collections of the Museum of Comparative Zoology, Cambridge, Massachusetts (M.C.Z. Cat. Nos. 9,508, 9,509).

PANDALIDAE.

Plesionika mexicana, sp. nov.

(Text-figure 1).

Type: Holotype ovigerous female, Cat. No. 36,940, Department of Tropical Research, New York Zoological Society. From Station 136, D-1, Arena Bank, Lat. 23° 29′ N., Long. 109° 25′ W., 45 fathoms, muddy bottom, April 3, 1936.

Diagnosis: Rostrum much longer than antennal scale with 10 to 14 ventral spines and the spines of the basal crest barbed at the tip and all but the most anterior movable. Second pair of legs very unequal. Carpus of three posterior legs much shorter than propodus which is slightly more than three times as long as the dactyl.

Description: The carapace is about two-fifths as long as the abdomen. The posterior half is smoothly rounded, the low carina of the dorsal crest arising slightly in front of the midpoint of the carapace. Arising from the crest are four or five barbed spines, the posterior three or four of which are movable. Two or three of the spines are behind the orbit and they increase in size from the first to the third. The antennal spine is long and slender, about twice as long as the stout branchiostegal spine.

The rostrum is almost twice as long as the carapace. It bends slightly downward in front of the eyes and ascends gradually from that point to the apex. Following the barbed spines at the base of the rostrum there is usually, but not always, a smooth interspace that extends beyond the level of the antennal scale and this is followed by four or five progressively smaller spines, the distal two being placed just back of the tip of the rostrum. On the ventral margin are 10 to 14, usually 13, subequal spines separated by successively longer interspaces.

The abdomen is dorsally smooth and rounded without a carina on any of the somites, although the third is somewhat compressed and forms a distinct angle. There are no teeth or spines on any of the segments with the exception of the spines arming the acute postero-lateral angles of the fourth and fifth pleura. The sixth segment, which is about one and two-thirds as long as the fifth, is also provided with a spine at the corresponding angle. Somewhat shorter than the sum of the two preceding somites, the telson is armed with three pairs of lateral and three pairs of terminal spinules; it is slightly shorter than the inner branch of the uropods.

The large, globular eyes have a distinct but incompletely separated ocellus on the dorsal surface of the stalk.

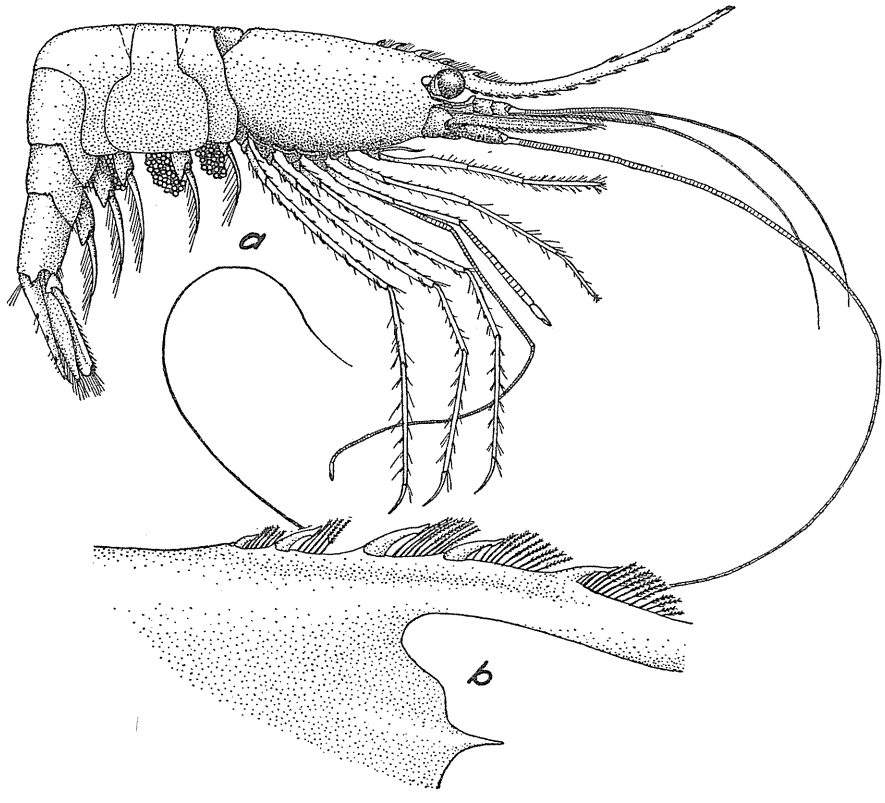
The second and third joints of the antennular peduncle are subequal and the stylocerite slightly exceeds the first segment. The subequal flagella are about half again as long as the rostrum.

The antennal scale is narrow and tapers distally to a truncate tip that is considerably surpassed by the stout outer spine. The antennal flagella are almost twice as long as the animal.

The external maxillipeds are provided with well-developed exopods and project beyond the antennal scale by about one-fifth of the terminal joint. The first pair of legs is as long as the external maxillipeds. The second legs are very unequal, the right extending beyond the antennal scale by no more than the length of the fingers and provided with about 20 carpal segments, the left exceeding the rostrum by almost half the carpus and provided with about 100 carpal segments. The propodi of the last three legs are about one and one-half times the carpi and about three times as long as the dactyls.

The eggs are very small, about 0.3 mm. long, and very numerous.

The holotype is 51 mm. long, of which the carapace measures 9.5 mm., the abdomen 25 mm. and the rostrum 18 mm.



Text-figure 1.

Plesionika mexicana, sp. nov. **a.** Female holotype. **b.** Base of rostrum of holotype.

Local Distribution: A total of 93 specimens was taken from Arena Bank (Station 136), Gorda Banks (Station 150) and three miles east of Cape Falso (Station 151) between 30 and 75 fathoms, on various types of bottoms, including muddy, sandy, shelly and hard.

Sex and Size: All but three of the females are laden with eggs. These specimens have a carapace length of from 6 to 12 mm. The non-ovigerous females give corresponding measurements of 6.3 to 8.6 mm., and the males, from 5 to 11.2 mm. It is of interest that the five males from Station 136 were all very small and it was only in deeper water (65 to 75 fathoms) at Stations 150 and 151 that males were found in abundance and of a size comparable to that of the ovigerous females.

Color in Life: General color translucent white with short, longitudinal stripes, scarlet by Ridgways Color Standards, alternating with areas speckled with opaque white dots. The amounts of scarlet and white are variable, but the general pattern is quite constant, even in specimens taken from various types of bottom; there is a transverse red bar across the carapace immediately behind base of rostral keel, a second on first abdominal segment, a third on third abdominal segment (usually brightest in the males) and a fourth at base of telson; the remainder of scarlet body markings are short, irregular, longitudinal streaks on the abdominal pleura; antennae and peri-opods barred with scarlet and white; pleopods, uropods and telson streaked longitudinally with scarlet in most individuals, sometimes entirely translucent white. Eyes greenish. Eggs bluish green.

Remarks: The rostral armature is variable in this species, but the holotype represents by far the commonest arrangement. *P. mexicana* is apparently most closely related to *P. binoculus* (Bate), but it differs in its smaller size and less elevated dorsal crest, which is armed with barbed rather than simple spines.

Material: *Station* 136: D-1 (3 ♂, 22 ♀), D-11 (1 ♀), D-24 (2 ♂, 13 ♀), D-26 (1 ♂, 3 ♀). *Station* 150: D-16 (21 ♂, 22 ♀). *Station* 151: D-1 (5 ♂, 1 ♀). Cat. Nos. 36,940 (holotype) and 36,941 to 36,946 inclusive (paratypes). Six male and 12 female paratypes are deposited in the collections of the Museum of Comparative Zoology, Cambridge, Massachusetts (M. C. Z. Cat. Nos. 9,491, 9,492, 9,493).

Plesionika beebei, sp. nov.

(Text-figure 2).

Type: Male holotype, Cat. No. 36,948, Department of Tropical Research, New York Zoological Society. From Station 148, T-2, 13 miles northeast by north of San Ildefonso Island, Lat. 26° 48′ 40″ N., Long. 111° 20′ 30″ W., 300 fathoms, April 17, 1936.

Diagnosis: Rostrum much longer than antennal scale, nearly straight, distal third of dorsal surface usually unarmed except for a single sub-apical tooth, ventral surface armed throughout with 10 to 15 teeth. Second pair of legs subequal. Carpus of three posterior legs somewhat shorter than propodus, dactyl of third leg more than half as long as propodus.

Description: The integument is soft and almost membranous.

The carapace is about three-tenths as long as the abdomen. It is compressed on the dorsal mid-line into a low but well-marked carina which bears three or four spines behind the orbit, the first two being movable. Posterior to this crest there is a distinct cervical groove behind which and above the strong supra-branchial ridge is a depressed pubescent area. The antennal is but little longer than the branchiostegal spine.

The rostrum is about twice as long as the antennal scale and ascends very slightly in its distal half. It is armed dorsally, in addition to the three or four spines behind the orbit, with six or seven teeth on the proximal half followed by a smooth interspace and a single small tooth just back of the tip. Ventrally there are 10 to 15 teeth which are largest at the mid-point of the rostrum; they become more distantly spaced anteriorly.

The abdomen is smoothly rounded for the entire length of its dorsal surface. The pleuron of the fourth somite has an acute postero-lateral angle, and that of the fifth is spinose. On the sixth segment, which is two and one-third times as long as the fifth, there is a similar small spine at the postero-lateral angle. The telson is slightly longer than the inner branch of the uropods and is armed with four pairs of dorso-lateral and three pairs of terminal spines.

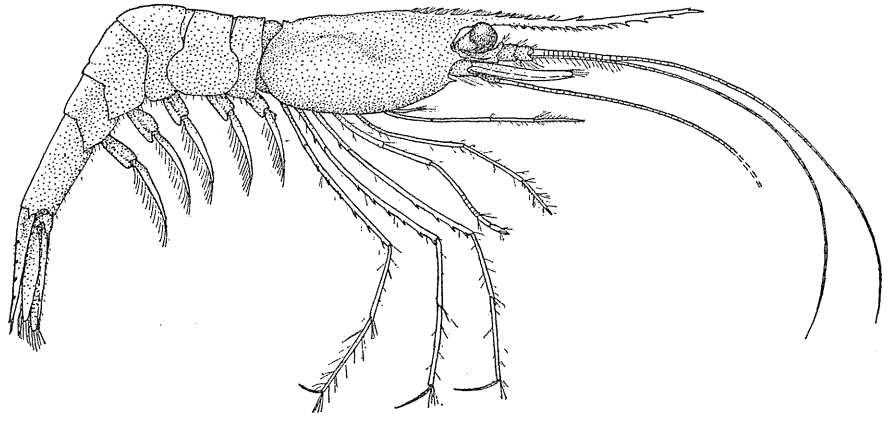
The large, globular eyes have a very small incomplete ocellus on the dorsal surface of the stalk.

The second and third joints of the antennular peduncle are subequal in length and the stylocerite is somewhat shorter than the first joint. The subequal flagella are more than twice as long as the rostrum.

The antennal scale is narrow and tapers slightly to a truncate tip which is exceeded but little by the outer spine.

The external maxillipeds have a well developed exopod and exceed the antennal scale by about one-third of the length of the distal segment. All of the legs are very slender. The first pair reaches nearly as far forward as the external maxillipeds. The second pair are subequal in length and the carpi are made up of eight or nine segments. The third legs extend slightly beyond the tip of the rostrum, the carpus is a little shorter than the propodus and the lanceolate dactyl more than half as long as the propodus. The fourth and fifth legs are similar to the third, except that the dactyl of the fifth pair is less than one-third as long as the propodus.

The holotype is 40 mm. long of which the carapace measures 6 mm., the abdomen 21 mm. and the rostrum 12.3 mm.



Text-figure 2.
Plesionika beebei, sp. nov. Male holotype.

Local Distribution: A total of seven specimens was taken from 23 miles east by south of Tortuga Island (Station 139), 13 to 20 miles northeast of San Ildefonso Island (Station 148) and Gorda Banks (Station 150), between 40 and 500 fathoms.

Sex and Size: Most of the specimens are in poor condition due to the soft integument. None of the females is ovigerous and the condition of the endopod of the first pleopods of the males seems to indicate that these specimens are not fully mature. The males have a carapace length of 6 to 8 mm., and the single unmutilated female 10.7 mm.

Color in Life: A paratype from Station 139 was translucent white, the carapace and abdominal pleura speckled with scarlet, and the uropods and telson entirely scarlet.

Remarks: This species is apparently closely related to *P. ortmanni* Doflein from the western Pacific, but differs in having the carpi of the three posterior legs shorter than the propodi and in having eight rather than more than 30 joints in the carpi of the second legs.

Material: *Station* 139: T-2 (1 ♂). *Station* 148: T-2 (1 ♂), T-6 (1 ♂), T-8 (1 ♂). *Station* 150: D-5 (2 ♀ and 1 carapace). Cat. Nos. 36,948 (holotype); 36,947, 36,949 and 36,950 (paratypes). One male paratype is

deposited in the collections of the Museum of Comparative Zoology, Cambridge, Massachusetts (M. C. Z. Cat. No. 9,494).

Pantomus affinis, sp. nov.

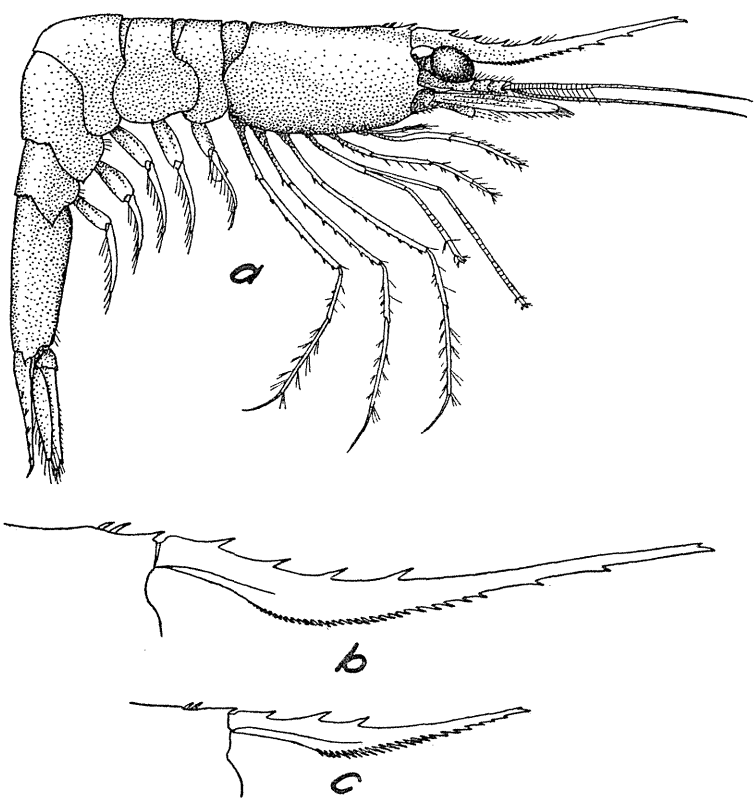
(Text-figure 3).

Type: Male holotype, Cat. No. 36,1052, Department of Tropical Research, New York Zoological Society. From Station 147, D-2, Santa Inez Bay, Lat. 26° 56′ 30″ N., Long. 111° 48′ 30″ W., 60 fathoms, April 17, 1936.

Diagnosis: Five to eight spines on dorsal edge of rostrum anterior to articulation with carapace; 27 to 36 teeth on ventral edge. Four to six, usually five, pairs of dorso-lateral spines on telson not including the pair just above the terminal spinules. Scaphognathite of second maxilla broad.

Description: The carapace is a little more than one-fourth as long as the abdomen, smoothly rounded on the posterior half and anteriorly compressed into a low frontal crest which is armed with two small movable spines and a fixed spine at the articulation with the rostrum. The supra-branchial ridge is clearly defined but not prominent and the antennal spine is perceptibly larger than the branchiostegal.

The rostrum is about three-fourths again as long as the carapace, armed above with four to seven spines on the proximal half and a small spine just



Text-figure 3.

Pantomus affinis, sp. nov. **a.** Male holotype. **b.** Rostrum of holotype of *P. affinis*. **c.** Rostrum of a cotype of *P. parvulus*.

back of the tip. On the ventral margin there is a series of 27 to 36 spines that are proximally reduced to indistinct serrations. A few setae arise from each of the spaces between the dorsal spines and each of the intervals between the ventral spines is provided with a single seta.

The third segment of the abdomen is bent at a sharp angle and its posterior half sharply carinated; the other segments are smoothly rounded dorsally. The postero-lateral angle of the pleuron of the fourth somite is provided with a small spine, and that of the fifth is narrowly acute. The sixth segment is two and two-thirds times as long as the preceding. The telson is slightly longer than the inner branch of the uropods and is armed with four to six, usually five, pairs of dorso-lateral spinules and three pairs of terminal spines.

The cornea of the eye is very large and semicircular so that it appears flattened in lateral view. There is no distinct ocellus.

The second and third joints of the antennular peduncle are subequal in length. The flagella are subequal and about one-third again as long as the rostrum.

The antennal scale is narrow and tapers distally to a rounded tip which slightly exceeds the outer spine.

The third maxillipeds attain the distal fifth of the antennal scale and are provided with well developed exopods. The first pair of legs are minutely chelate and very little shorter than the third maxillipeds. The second legs are unequal; the left reaches beyond the tip of the antennal scale and the carpus is composed of about 18 joints, whereas the right falls short of the tips of the first legs and there are but eight joints in the carpus. The three posterior legs are similar and exceed the tip of the antennal scale by the dactyls and part of the propodi. The carpi are about two-thirds, and the dactyls distinctly more than half, as long as the propodi.

The male holotype is 33 mm. long of which the carapace measures 5.2 mm., the abdomen 18.8 mm., and the rostrum 9 mm.

Local Distribution: A total of 66 specimens was taken from Santa Inez Bay (Station 147) and three miles east of Cape Falso (Station 151), between 60 and 65 fathoms, on muddy and rocky bottoms.

Sex and Size: The males have a carapace length of 4.2 to 6.8 mm. and the females, none of which is ovigerous, give comparative measurements of 3.1 to 6.7 mm.

Color in Life: Body transparent and colorless except for a variable number of red and yellow chromatophores on carapace and abdomen. Mouthparts yellowish.

Remarks: This species is very similar in general appearance to the only other species in the genus, *P. parvulus* A. Milne Edwards, from the Atlantic. There are, however, a few noticeable differences between the *Zaca* specimens and Milne Edwards' types which are deposited in the Museum of Comparative Zoology. *P. affinis* is apparently a larger species, since few of the cotypes are more than 25 mm. long. *P. parvulus* has only two to four, generally three, dorsal teeth at the base of the rostrum in front of the articulation, whereas *P. affinis* has from four to seven. There are normally 21 to 28 ventral rostral spines in *P. parvulus* as compared with 27 to 36 in *P. affinis*, and those in the latter species become mere indistinct serrations proximally, whereas in the Atlantic species even the first ventral spines are well marked. In *P. parvulus* there are usually six pairs of dorso-lateral spines on the telson, although rarely there may be only five; in *P. affinis*, five is the normal number and four or six are found but occasionally. Finally, the scaphognathite of the second maxilla is distinctly narrower in the genotype than in the Pacific species.

Material: *Station* 147: D-2 (37 ♂, 28 ♀). *Station* 151: D-1 (1 ♂). Cat. Nos. 36,1052 (holotype); 36,1053, 36,1054 (paratypes). Six male and seven

female paratypes are deposited in the Museum of Comparative Zoology, Cambridge, Massachusetts (M. C. Z. Cat. No. 9,495).

Heterocarpus vicarius Faxon.

Heterocarpus vicarius Faxon, W., *Bull. Mus. Comp. Zool.*, vol. 24, p. 203, 1893.

Heterocarpus vicarius Faxon, W., *Mem. Mus. Comp. Zool.*, vol. 18, p. 148, pl. 40, figs. 1-1b, pl. 41, figs. 2, 2a, 1895.

General Range: Previously known only from the Bay of Panama.

Local Distribution: A total of three specimens was taken 20 miles northeast of San Ildefonso Island (Station 148) and from Gorda Banks (Station 150), between 40 and 300 fathoms.

Sex and Size: The specimens are of the same small size, about 28 mm. long (carapace, 7.5 mm.)

Remarks: These specimens differ from the smallest of Faxon's types in the Museum of Comparative Zoology in having a more membranous integument, less pronounced lateral carinae on the carapace and a less upturned rostrum, but as the *Zaca* specimens are considerably smaller than any of the *Albatross* specimens these comparatively unimportant differences may well be accounted for by the age of the specimens.

This is apparently the first time that this species has been taken outside of the Gulf of Panama and the northernmost record for any member of the genus on the Pacific coast of America.

Material: *Station* 148: T-6 (1 young). *Station* 150 D-5 (2 young). Cat. Nos. 36,1055, 36,1056.

CRANGONIDAE.

Crangon bellimanus (Lockington).

Alpheus bellimanus Lockington, W.N., *Proc. Calif. Acad. Sci.*, vol. 7, p. 34, 1877.

Crangon bellimanus Schmitt, W.L., *Univ. Calif. Pub. Zool.*, vol. 23, p. 75, fig. 51, 1921.

General Range: Monterey to San Diego, California; Chile (Coutière).

Local Distribution: One male was taken from Arena Bank (Station 136: D-6) in 35 fathoms, on a sandy bottom. Cat. No. 36,1057.

Sex and Size: The single male is about 13.5 mm. long (carapace and rostrum, 4.9 mm.).

Remarks: The present specimen differs from Holmes' description (*Occas. Papers Calif. Acad. Sci.*, vol. 7, p. 184, pl. 2, fig. 41, 1900) only in having the antennal scale slightly longer than the antennular peduncle rather than equal to it.

This is the first record for the species from Lower California.

Crangon ventrosus (H. Milne Edwards).

Alpheus ventrosus Milne Edwards, H., *Hist. Nat. Crust.*, vol. 2, p. 352, 1837.

Alpheus ventrosus Gravely, F. H., *Bull. Madras Govt. Mus.*, N.S. vol. 1, no. 2, pt. 1, p. 78, pl. 1, figs. 2a-3b, 1930.

General Range: Entire Indo-Pacific region from the Gulf of Akaba, Red Sea, Indian Ocean to Tahiti, the Hawaiian Islands and the Gulf of California.

Local Distribution: Ten specimens (3 males, 4 females and 3 young) were taken off Arena Bank (Station 136 D-33) at a depth of 2½ fathoms in coral (*Pocillopora ligulata*). Cat. No. 36,1058.

Sex and Size: All four adult females are ovigerous and range in length from 27.8 to 32 mm. (carapace and rostrum, 8.9 to 10 mm.); the males are from 24 to 29 mm. long (carapace and rostrum, 8.2 to 9.1 mm.); and the immature specimens from 14 to 20 mm. (carapace and rostrum, 4.8 to 6.8 mm.).

Remarks: In one of the ovigerous females the telson is curiously deformed. It is split at the end, with two quite normal tips separated by an angle of about 90°. The posterior pair of dorsal spinules is placed almost in the midline, one of them being much the smaller and placed slightly anterior to the other.

This is the second record of the capture of this species in the Gulf of California.

Three specimens are deposited in the collections of the Museum of Comparative Zoology, Cambridge, Massachusetts (M. C. Z. Cat. No. 9,496).

Crangon arenensis, sp. nov.

(Text-figure 4).

Type: Male holotype, Cat. No. 36,1059, Department of Tropical Research, New York Zoological Society. From Station 136 D-33, off Arena Bank, 2½ fathoms, in coral (*Pocillopora ligulata*), May 2, 1936.

Diagnosis: Rostrum triangular, carinate and separated from orbital hoods by distinct sulci. Extra-corneal spines present. Second joint of antennular peduncle about twice as long as third; stylocerite not reaching second segment. Inferior spine of basicerite present. Larger chela slightly more than twice as long as high with slight dorsal and ventral emarginations but no lateral grooves or spines. Smaller chela little more than three times as long as high. First carpal article of second legs shorter than sum of three following. Three posterior legs with unarmed meri and simple, acute dactyls.

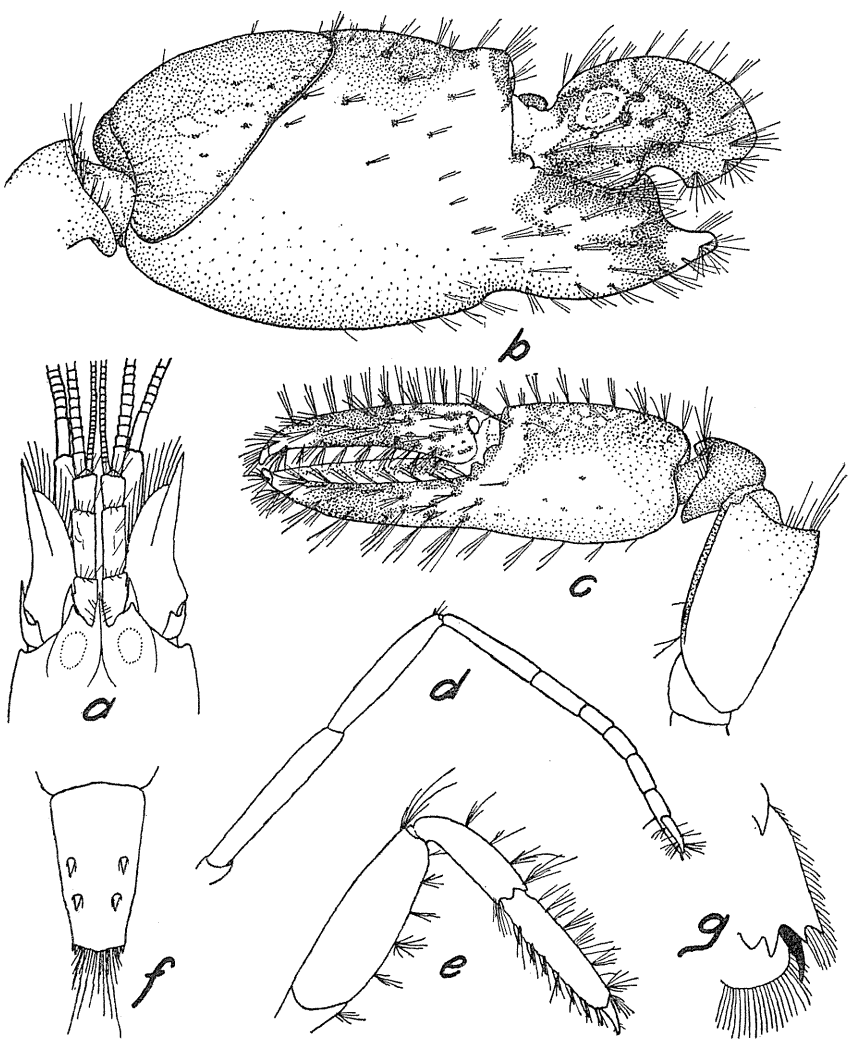
Description: The rostrum reaches the distal third of the visible portion of the first antennular segment. It is dorsally carinate, sparsely setose and separated from the orbital hoods by distinct sulci. The extra-corneal spines are prominent and reach as far as the distal third of the rostrum.

The second segment of the antennular peduncle is about one-third again as long as the visible portion of the first and about twice as long as the third. The stylocerite does not attain the end of the first segment. The inferior spine of the basicerite of the antennae is well developed and reaches the end of the first antennular segment. The carpocerite overreaches the antennular peduncle by about two-thirds of the length of the distal segment of the latter. The nearly straight outer spine of the antennal scale reaches the tip of the carpocerite and its distal third extends beyond the blade.

The third maxillipeds are hairy and extend beyond the carpocerite by about half of the terminal segment.

The merus of the larger cheliped is less than twice as long as broad at the distal end and unarmed. The chela is strongly compressed from side to side and but little less than half as high as long. Its outer surface is almost flat and smooth, the inner slightly more convex and hairy. Behind the articulation of the dactyl on the dorsal surface is an obliquely transverse groove which is most marked on the inner surface, but it terminates abruptly without extending far onto either lateral face. Ventrally there is a similar shallow emargination below the articulation of the dactyl, and above this ventral sulcus there is a very slight, ill-defined depression. Aside from

these emarginations and the well marked oblique groove on the proximal half of the palm, the chela is wholly free from sculpture. The thick, truncate dactyl is about three-fifths as long as the palm; it works in a very nearly vertical plane and extends somewhat beyond the fixed finger. In alcohol, the chela is mottled with blue and purple pigments. The smaller chela is just about three times as long as high and shows no trace of sculpture of any kind aside from a very slight depression on the ventral margin at the base of the fixed finger and the usual proximal oblique groove. The dactyl is about one-fourth again as long as the palm. The entire chela, particularly the fingers, is provided with numerous tufts of setae. The coloration in alcohol is similar to that of the larger hand.



Text-figure 4.

Crangon arenensis, sp. nov. **a.** Frontal region. **b.** Outer face of larger chela. **c.** Outer face of smaller chela. **d.** Right leg of second pair. **e.** Right leg of third pair. **f.** Telson. **g.** Outer branch of right uropod.

The second pair of legs is long, reaching the distal half of the larger chela. The first carpal joint is as long as the sum of the second and third and half of the fourth segments. The fifth is longer than the third or fourth which are subequal but shorter than the second.

The merus of the third leg is about one-third as broad as long and unarmed. The dactyls of the three posterior legs are simple, slender and acute.

The outer spine of the exopods of the uropods is black with a horn-colored tip.

The male holotype is 20 mm. long, of which the carapace and rostrum measure 7.5 mm. The larger chela is 10.8 mm. long and the smaller 7 mm.

Material: The male holotype is the only specimen in the collection.

Remarks: This species apparently resembles *C. gracilis alluaudi* (Coutière) from the Maldive Archipelago which, according to Coutière, differs from the typical *C. gracilis* (Heller) only in having simple rather than biunguiculate dactyls on the three posterior legs. De Man (Siboga-Expeditie, *Monogr.* 39a, 1911, p. 338) states that, in the type of *C. gracilis*, the second antennular article appears shorter than the visible part of the first and a little longer than the third, whereas in *C. arenensis* the second article is considerably longer than the visible part of the first and about twice as long as the third. In *C. gracilis* the stylocerite is said to reach the second third of the second antennular article, while in the present species it falls short of the end of the first segment. The merus of the third legs in *C. gracilis* is apparently more slender, being four times as long as wide as against about three in *C. arenensis*.

Crangon cylindricus (Kingsley).

Alpheus cylindricus Kingsley, J. S., *Bull. U. S. Geol. and Geogr. Surv.*, vol. 4, no. 1, p. 196, 1878.

Alpheus vanderbilti Boone, L., *Bull. Vanderbilt Mar. Mus.*, vol. 3, p. 163, pl. 58, text-fig. 5, 1930.

General Range: Off Key West, Florida, Barbados and Pearl Island, Bay of Panama.

Local Distribution: A total of 3 specimens was taken from Arena Bank (Station 136) in 35 and 45 fathoms, on muddy bottoms. One specimen was found inside a sponge.

Sex and Size: The male is 18.7 mm. long, the female without eggs from D-12 is 17.2 mm., and the ovigerous female from D-13 is 20.8 mm.

Remarks: These specimens have been compared with four specimens of "*C. vanderbilti* (Boone)" from the Bermudas and there is no apparent difference between the two. In all of the specimens from both the Atlantic and the Pacific the antennal scale reaches almost to the extremity of the antennular peduncle. Kingsley's statement regarding this ratio is ambiguous and might be construed to mean that the laminate portion, and not the terminal spine of the scaphocerite, reaches the end of the second joint, which is true of the specimens at hand. The dactyl of the larger chela may or may not have a subterminal rounded tooth on the lower margin in addition to the acute tooth which fits over the extremity of the propodus. Miss Boone's description of the dactyls of the last three pairs of legs is misleading, since she calls them "monodactyl" and also adds, "the dactyl is short, curved, acuminate," although her figure correctly depicts them as biunguiculate.

This, to my knowledge, is the first Pacific record of this species since that of the type from the Bay of Panama.

Material: *Station* 136: D-12 (1 ♀), D-13 (1 ♂, 1 ♀). Cat. Nos. 36,1060, 36,1061.

Crangon normanni (Kingsley).

Alpheus affinis Kingsley, J. S., *Bull. U. S. Geol. and Geogr. Surv.*, vol. 4, no. 1, p. 195, 1878. (Not *A. affinis* Guise, 1854).

Alpheus normanni Kingsley, J. S., *Proc. Acad. Nat. Sci. Phila.*, p. 93, 1878.

Alpheus packardii Kingsley, J. S., *Proc. Acad. Nat. Sci. Phila.*, p. 417, 1879.

Alpheus packardii Zimmer, C., *Zool. Jahrb.*, suppl. 11, p. 409, figs. A^2-G^2, 1913.

General Range: North Carolina and Bermuda to Florida and West Indies; Panama.

Local Distribution: A single male specimen (Cat. No. 36,1062) was taken from Santa Inez Bay (Station 142 D-1) in 30 fathoms, on a bottom composed of sand and crushed shell.

Sex and Size: This male measures 20 mm. in length (carapace, 7 mm.).

Remarks: A comparison of this specimen with specimens of *"C. packardii"* from the Bermudas fails to disclose a single character by which the Atlantic and Pacific forms can be distinguished. I have also compared the *Zaca* specimen with two cotypes of *C. normanni* in the Museum of Comparative Zoology and found that, as in those specimens, the third maxillipeds fall short of the extremity of the antennal scale. Although Kingsley did not mention the similarity between the two species, the only important differences between the two, as described by him, is in the length of the third maxillipeds. Since it is found that Kingsley's description of *C. normanni* is erroneous in this respect, the only important distinguishing character must be abandoned and the two species become synonymous.

To my knowledge, this is the first record of this species from Pacific waters since the types were collected at Panama.

Synalpheus charon (Heller).

Alpheus charon Heller, C., *Sitzungsber. Kais. Akad. Wiss. Wien*, vol. 44, p. 272, pl. 3, figs. 21 and 22, 1861.

Synalpheus charon de Man, J. G., Siboga-Exped., *Monogr.* $39a^1$, p. 245, 1911.

General Range: Red Sea, Maldive and Laccadive Archipelagos and the Hawaiian Islands.

Local Distribution: A total of 11 specimens (Cat. No. 36,1063) was taken off Arena Bank (Station 136 D-33) in 2½ fathoms, from coral (*Pocillopora ligulata*).

Sex and Size: The collection includes four males, 12.3 to 15 mm. long, and seven ovigerous females, 14.2 to 20 mm. long.

Remarks: Some of these specimens closely resemble *S. helleri* de Man (*Zool. Jahrb. Abth. f. Syst.* 9, p. 743, pl. 35, fig. 63, 1897) in the form of the frontal spines and the length of the antennal scale. The posterior margin of the telson is more than one-third of the length of the telson in all of the specimens. It is very likely that study of additional specimens will show that *S. helleri* is synonymous with this species.

This is the first record for the species east of the Hawaiian Islands.

Two specimens, male and female, are deposited in the collections of the Museum of Comparative Zoology, Cambridge, Massachusetts. (M. C. Z. Cat. No. 9,497).

Synalpheus sanlucasi Coutière.

Synalpheus sanlucasi Coutière, H., *Proc. U. S. Nat. Mus.*, vol. 36, p. 41, fig. 23, 1909.

General Range: Cape San Lucas, Lower California.

Local Distribution: Two males (Cat. No. 36,1064) were taken off Arena Bank (Station 136 D-33) in 2½ fathoms in coral (*Pocillopora ligulata*).

Sex and Size: The two males are each 9.1 mm. long.

Remarks: This species has been known previously only from the types taken at Cape San Lucas by John Xantus.

Synalpheus townsendi mexicanus Coutière.

Synalpheus townsendi mexicanus Coutière, H., *Proc. U. S. Nat. Mus.*, vol. 36, p. 34, fig. 17, 1909.

General Range: Off Ceralbo Island, Lower California, in 9½ fathoms.

Local Distribution: A total of 11 specimens was taken from Arena Bank in 2½ to 45 fathoms, on muddy bottoms and in coral (*Pocillopora ligulata*).

Sex and Size: The males are from 10.1 to 12.6 mm. long and the females, none of which are ovigerous, 11.1 to 12.7 mm. long.

Remarks: This is apparently the first record for the species since that of the type which was taken by the *Albatross* in 1888.

Material: *Station* 136: D-12 (4 ♂, 2 ♀), D-13 (2 ♂, 1 ♀), D-33 (2 ♂). Cat. Nos. 36,1065, 36,1066, 36,1067. Two specimens, male and female, are deposited in the collections of the Museum of Comparative Zoology, Cambridge, Massachusetts (M. C. Z. Cat. No. 9,498).

Synalpheus digueti Coutière.

Synalpheus digueti Coutière, H., *Proc. U. S. Nat. Mus.*, vol. 36, p. 48, fig. 28, 1909.

General Range: Lower California.

Local Distribution: A total of 22 specimens (12 males and 10 females) (Cat. No. 36,1068) was taken off Arena Bank (Station 136 D-33) in 2½ fathoms, in coral (*Pocillopora ligulata*).

Sex and Size: The males range from 7.8 to 15.7 mm. in length and the females, all of which are ovigerous, from 10.8 to 20 mm.

Remarks: This is the first record for the species since the description of the types.

Three males and two ovigerous females are deposited in the collections of the Museum of Comparative Zoology, Cambridge, Massachusetts (M. C. Z. Cat. No. 9,499).

Synalpheus herricki Coutière.

Synalpheus herricki Coutière, H., *Proc. U. S. Nat. Mus.*, vol. 36, p. 74, fig. 44, fig. 45 (subsp. *angustipes*), fig. 46 (subsp. *dimidiatus*), 1909.

General Range: Off west coast of Florida.

Local Distribution: A total of 12 specimens was taken from Arena Bank (Station 136) in 35 to 45 fathoms, on muddy bottoms.

Sex and Size: The males are 10.1 to 13.5 mm. long; the single female with eggs measures 18.2 mm. in length; the non-ovigerous females range from 13.7 to 18.7 mm. in length.

Remarks: Although there is little doubt that comparative measurements

of the appendages play an important part in the separation of the species and subspecies of this genus, it seems very probable that undue importance has been given to some of the minor variations in several instances, and it is likely that subsequent examination of representative series of specimens will considerably reduce the number of species and particularly varieties that are recognized at present. As this is the first Pacific record for *S. herricki* and as three varieties have been described from the Atlantic, one would expect the specimens to disclose characters of at least subspecific value. There are some minor differences between the *Zaca* specimens and Coutière's description. The rostrum is very small in comparison with the lateral teeth of the front and the carpus of the second legs is very slightly wider in proportion to its length than in Coutière's figure but, as Coutière has shown the first to be a variable character, I do not consider these differences worthy of even varietal designation, and since the subspecies *angustipes* and *dimidiatus* were taken at the type locality of the typical *S. herricki* there is a strong probability that these also exhibit the extremes of normal variation within the species.

One female specimen of the *Zaca* series from D-13 has a very abnormal left antennal scale. In this species the antennal scale is normally reduced to the outer spine, the blade being entirely absent. In this specimen, however, the reverse is true, there being a well-developed scale which is deeply notched at the tip, but no rigid outer support of any kind.

Material: *Station* 136: D-12 (4 ♂, 2 ♀, 1 mutilated), D-13 (1 ♂, 4 ♀). Cat. Nos. 36,1069, 36,1070. Two specimens, male and female, are deposited in the collections of the Museum of Comparative Zoology, Cambridge, Massachusetts (M. C. Z. Cat. No. 9,500).

Pomagnathus, gen. nov.

Eyes covered by carapace. Rostrum present. Antennules short, the external flagellum with an inconspicuous, single-jointed branch on the ventral surface. Antennal scale stout with a reduced blade; antennal flagellum very long. Ischio-meropodite of third maxillipeds greatly expanded to form an opercular covering over the other mouth parts. First pair of legs dissimilar. Carpus of second legs five-jointed. Dactyls of last three legs biunguiculate. No epipods on any thoracic legs.

Type: *Pomagnathus corallinus,* sp. nov.

Pomagnathus corallinus, sp. nov.

(Text-figure 5).

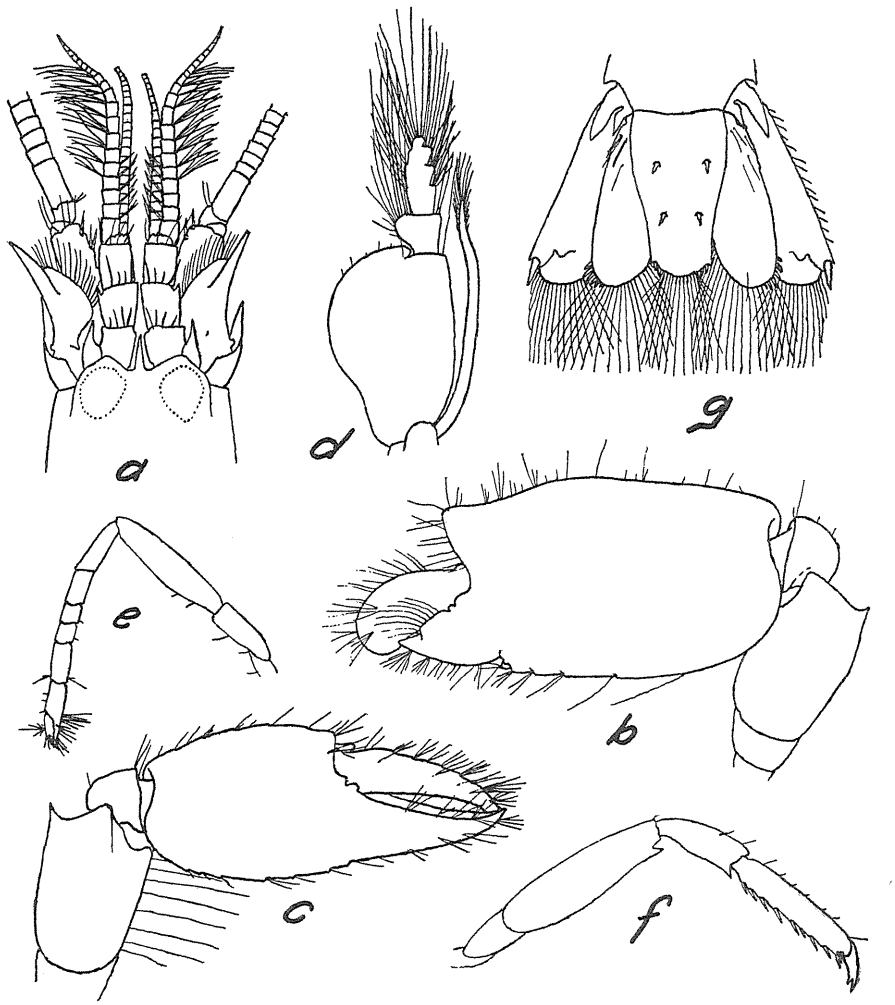
Type: Holotype ovigerous female, Cat. No. 36,1071, Department of Tropical Research, New York Zoological Society. From off Arena Bank (Station 136 D-33), in 2½ fathoms in coral (*Pocillopora ligulata*), May 2, 1936.

Description: The slender, spiniform rostrum does not attain the end of the first antennular segment and posteriorly disappears just back of the frontal margin, the deep sulcus between the orbital hoods being devoid of any trace of a rostral carina except anteriorly. The orbital hoods are produced but not spinose.

The visible portion of the first antennular segment is subequal to the second which, in turn, is slightly shorter than the third. The stylocerite tapers to a sharp point beyond the first antennular segment. The outer antennular flagellum is less than twice as long as the peduncle and bears an inconspicuous, single-jointed branch on the under side at the thirteenth segment. The inner flagella, although broken at the tips in the holotype, are apparently of about the same length as the outer. The basicerite of the antenna is armed with a small, acute ventral spine, and a larger outer spine

which almost attains the level of the third segment of the antennular peduncle. The stout carpocerite overreaches the antennular peduncle by almost the length of the third segment of the latter and the antennal scale is of about the same length. The blade of the latter is reduced so that the strong outer spine extends beyond it by about half its length. The antennal flagellum is slightly longer than the body of the animal.

The third maxillipeds extend slightly beyond the carpocerite. The distal segment is twice as long as the penultimate, while the ischio-meropodite is one and two-thirds times as long as the sum of the two following segments and about two-thirds as wide as long, so that the underlying mouth-parts are completely covered. All three maxillipeds are provided with well-developed exopods.



Text-figure 5.

Pomagnathus corallinus, sp. nov. **a.** Frontal region. **b.** Outer face of larger chela. **c.** Outer face of smaller chela. **d.** Third maxilliped. **e.** Second leg. **f.** Third leg. **g.** Telson and uropods.

Of the larger chela, the merus is about two-thirds as wide as long and armed with an acute spine at the distal end of the dorsal margin. The carpus is small, almost hemispherical and unarmed. The hand is strongly compressed from side to side and twisted in such a way that, when the base of the hand is vertical, the fingers work in a plane that is practically horizontal. The chela is little more than twice as long as high and smooth and bare on the outer surface. There is a distinct notch in the ventral margin at the base of the fixed finger and both margins are coarsely rugose toward the inner surface with tufts of setae arising from the rugae. So strongly compressed is the hand that the inner surface is longitudinally concave due to the pronounced twist. The dactyl is low and curved; it extends beyond the fixed finger and fits into a notch on the inner side of the latter. The hand of the smaller chela is two and one-third times as long as high and a little shorter than the larger chela. It also is twisted and similarly rugose and setose on the inner surface of the margins. The dactyl is almost as long as the palm.

The second pair of legs reaches slightly beyond the third maxillipeds. The first joint of the five-jointed carpus is about one and one-half times as long as the second which is equal to the sum of the third and fourth. The fifth is subequal to the second.

There is a tooth at the distal end of the lower margin of the meri of the third and fourth legs but none on that of the fifth. The dactyls of the last three legs are biunguiculate, the two hooks being of approximately equal width at the base and directed along the general axis of the dactyl.

The telson is about one and three-fourths times as long as its basal width, convex at the distal end with the outer corners acute. There is a single spine at the outer angle of the exopod of the uropods and the endopod is armed with a row of six distinct spines at the corresponding angle.

The eggs are about 0.3 mm. in diameter.

The holotype is 15 mm. long, of which the carapace and rostrum amount to 5 mm.

Material: The female holotype is the only example in the collection.

Remarks: This unique species is apparently most closely related to the species of the genus *Synalpheus* as shown by the lack of epipods on the thoracic legs, the well-developed orbital hoods, the biunguiculate dactyls of the third, fourth and fifth pairs of legs, the small branch on the outer flagellum of the antennules and the reduced blade of the antennal scale. It is readily distinguished from the members of that genus, however, by the form of the larger chela of the first pair of legs and the opercular third maxillipeds. The latter is a character met with in genera of other families as in *Gnathophyllum* and *Anchistus*.

HIPPOLYTIDAE.

Hippolyte californiensis Holmes.

Hippolyte californiensis Holmes, S. J., *Proc. Calif. Acad. Sci.*, ser. 2, vol. 4, p. 576, pl. 20, figs. 21-26, 1895.

Hippolyte californiensis Schmitt, W. L., *Univ. Calif. Pub. Zool.*, vol. 23, p. 48, fig. 26, 1921.

General Range: From Sitka, Alaska, to San Diego, California, to a depth of 10 fathoms.

Local Distribution: A total of 96 specimens was taken from kelp on the west coast of Lower California, from stomachs of the American Eared Grebe at Santa Inez Bay and dredged in Santa Inez Bay (Station 144) in 3 fathoms, on a sandy bottom with abundant weed.

Sex and Size: The specimens taken from the Grebes are in such condi-

tion that the determination of sex is practically impossible. Of the 94 specimens and fragments thus taken, however, 29 carried eggs. The single intact male is 18.5 mm. long, of which the carapace measures 3.7 mm. All intact females are ovigerous. The largest, that dredged in Santa Inez Bay, is 21.8 mm. long with a carapace of 4.2 mm. The other ovigerous females give carapace lengths ranging from 3 to 3.9 mm.

Remarks: Although this is the first record for the species from Lower California, the specimens agree with Holmes' description and figures even more closely than many of the specimens taken in California. In only one specimen, the male, is the extremity of the rostrum trifid. In all other specimens in which the rostrum is intact (31 specimens) the most anterior of the rostral spines is far back of the tip, although the last ventral spine is very near the apex. The rostral formula in these specimens is $\frac{2\text{—}4}{3\text{—}5}$, usually $\frac{3.}{5.}$

Material: *Off Cape San Lazaro* (*March* 28), *in kelp*: (1 ♂). *Santa Inez Bay* (*April* 9), *in stomach of female American Eared Grebe*: (17 specimens). *Santa Inez Bay* (*April* 11), *in stomach of male American Eared Grebe*: (75 specimens). *Station* 144: D-7 (1 ♀). Cat. Nos. 36,1072 to 36,1075 inclusive.

Hippolyte mexicana, sp. nov.

(Text-figure 6).

Type: Holotype male, Cat. No. 36,1076, Department of Tropical Research, New York Zoological Society. From Station 144, D-1, Santa Inez Bay, Lat. 26° 50′ 45″ N., Long. 111° 54′ 20″ W., 1 fathom, April 15, 1936, on a sandy bottom.

Diagnosis: Branchiostegal spine present. Rostrum armed both above and below. First segment of antennular peduncle armed distally with three spines. Last three pairs of thoracic legs markedly prehensile, the propodus being considerably dilated and the dactyl armed with seven terminal spines in addition to row on lower or inner margin.

Description: The smoothly rounded carapace is a little more than one-third as long as the abdomen. The supra-orbital spine is strong as is also the antennal spine which is separated by a notch from the acute lower angle of the orbit. The branchiostegal spine is set well back from the margin of the carapace.

The rostrum is about seven-tenths as long as the carapace, reaching the distal half of the second segment of the antennular peduncle. It is armed above with from two to four, usually three, teeth and below with from one to three, usually two, placed near the tip.

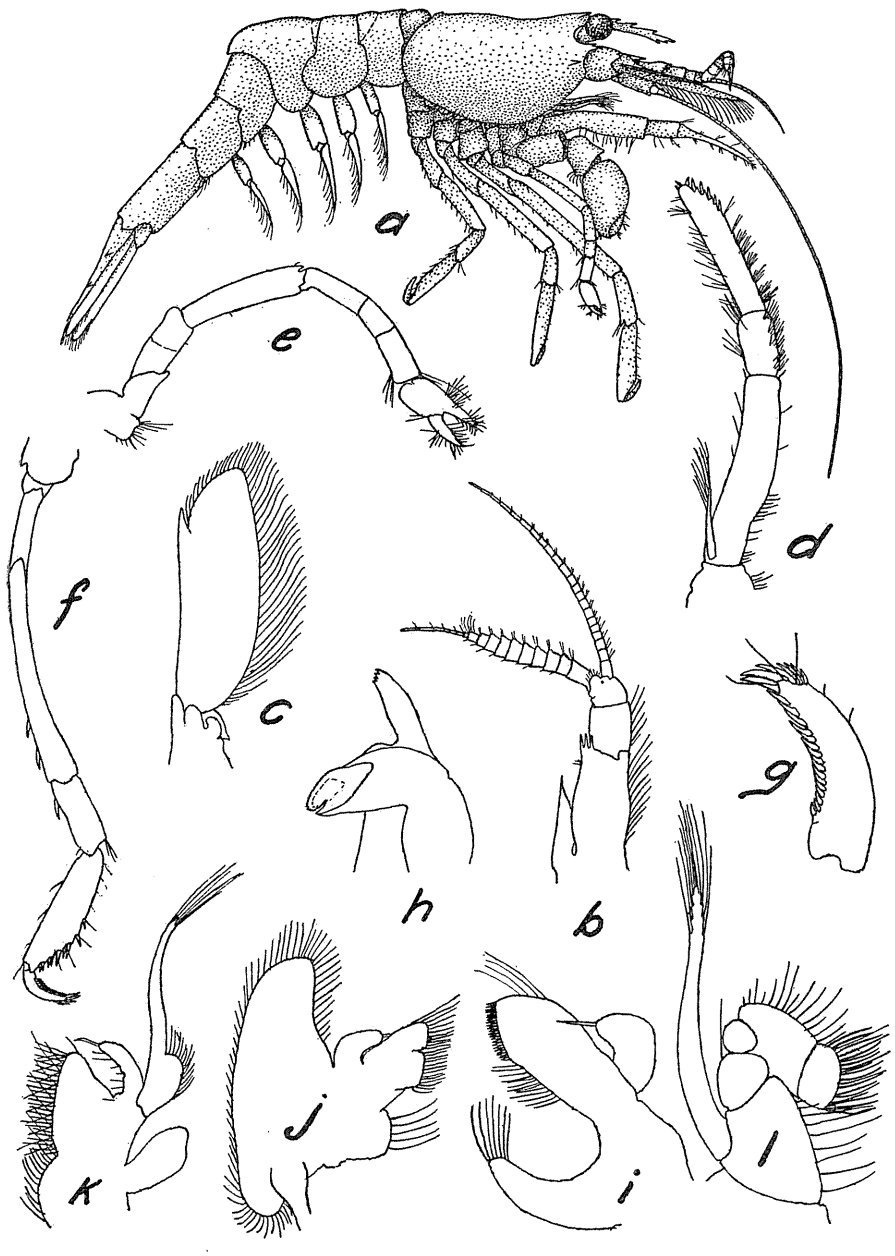
None of the abdominal segments is carinate although the third is compressed into a blunt cap extending over the base of the fourth. The sixth is about one and three-fourths times as long as the fifth. The telson, which is somewhat longer than the sixth somite, bears two pairs of dorso-lateral and three pairs of terminal spines, the median pair of the latter being the longest and the outer pair much the shortest.

The eyes are set on comparatively long stalks so that, when turned forward, they extend to the tip of the stylocerite.

The latter is well-developed and sharp but falls considerably short of the second antennular segment. On the outer part of the distal margin of the first segment are three strong spines. The inner antennular flagellum is made up of about 22 segments while the thick, twisted outer one is composed of about 16 segments, 10 of which make up the thickened proximal portion.

Although well-marked and strong, the outer spine of the antennal scale is greatly exceeded by the blade. The antennal flagellum is more than half as long as the body of the animal.

The external maxilliped extends beyond the tip of the antennal scale



Text-figure 6.

Hippolyte mexicana, sp. nov. **a.** Male holotype. **b.** Left antennule from above. **c.** Antennal scale. **d.** Third maxilliped. **e.** Second leg. **f.** Third leg. **g.** Dactyl of third leg. **h.** Mandible. **i.** First maxilla. **j.** Second maxilla. **k.** First maxilliped. **l.** Second maxilliped.

and bears a small exopod. The terminal segment is dorsally compressed and provided with a row of stout spines at the apex. The first legs are short and robust. In the second legs, the merus is about as long as the first two and half of the third joints of the carpus; the first carpal segment is not quite twice as long as the second and noticeably shorter than the third; the chela is about as long as the sum of the second and third carpal joints. The last three legs are similar in form with the dactyl folded against the inner margin of the dilated propodus. Much the longest of the three, the third leg extends forward beyond the third maxillipeds; the merus is longer than the carpus and propodus taken together; the propodus is expanded so that its greatest width is contained about three and one-half times in its length, and the inner edge is provided with a series of paired spines between which the dactyl rests when flexed; and the dactyl is provided with a row of about 16 overlapping spines on the inner margin and two large subequal spines at the tip which are followed by a row of five spines on the outer part of the apex which become progressively smaller proximally.

The male holotype is 18.5 mm. long, of which the carapace measures 3.8 mm., the abdomen 12.2 mm., and the rostrum 2.6 mm.

Local Distribution: A total of 41 specimens was taken from specimens of the American Eared Grebe at Santa Inez Bay and dredged in the same body of water (Station 144) in one fathom, on a sandy bottom with abundant weed.

Sex and Size: It is worthy of note that all of the specimens in which the determination of sex is possible are males. All of the specimens taken from Grebes are slightly smaller than the type, having a carapace length of 2.7 to 3.5 mm.

Remarks: This species is apparently the Pacific representative of the group made up of *H. exilirostris* Dana from Brazil and *H. curaçaoensis* Schmitt from Curaçao, both of which have the last three thoracic legs well adapted for prehensile purposes. *H. mexicana* differs from the first by having ventral teeth on the rostrum, the fingers of the second legs differently shaped and seven rather than three spines at the tips of the dactyls of the three posterior legs. The similarity between the present species and *H. curaçaoensis* is very striking. However, the dactyls of the three posterior legs in the latter terminate in three subequal spines, whereas in *H. mexicana* there are but two subequal spines followed by five smaller ones. The outer flagellum of the antennules in the present species is composed of 16 segments, 10 of which make up the thickened portion, while in *H. curaçaoensis* there are 8 segments, only the last of which is slender. In the Pacific species the basal joint of the antennular peduncle is armed with three spines in contrast to the single one in the Atlantic form. Finally, the outer spine of the antennal scale is apparently stouter and the legs longer and more slender, particularly the carpus of the second leg and the merus of the third, in *H. mexicana.*

Material: *Station* 144: D-1 (1 ♂). *Santa Inez Bay* (*April* 9), *in stomach of female American Eared Grebe*: (9 ♂, 1 mutilated specimen). *Santa Inez Bay* (*April* 11), *in stomach of male American Eared Grebe*: (16 ♂, 14 mutilated specimens). Cat. Nos. 36,1076 (holotype); 36,1077, 36,1078 (paratypes). Two of the male paratypes are in the collections of the Museum of Comparative Zoology, Cambridge, Massachusetts (M. C. Z. Cat. No. 9,501).

Latreutes, sp.

(Text-figure 7).

Diagnosis: Carapace armed with four strong dorsal spines behind orbit. Rostrum deep, armed with eight dorsal, one ventral and four terminal spines. Blade of antennal scale broad and extending beyond outer spine. Anterolateral angle of carapace armed with row of about ten spines.

Description: The carapace bears a row of four spines in the dorsal midline, the two in the middle being the largest. The antennal spine is strong and below it at the antero-lateral angle is a row of about ten spines, the four or five dorsal ones being set back from the edge of the carapace.

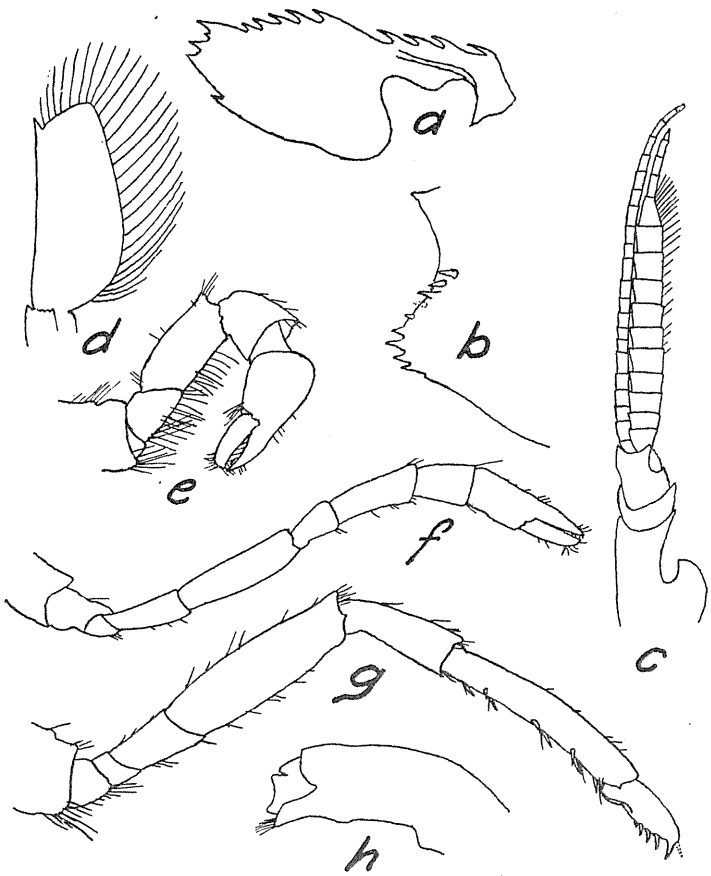
The rostrum bears eight dorsal teeth and there is a single tooth near the distal end of the deep lower margin. There are four unequal spines along the truncate apex. Supporting the rostrum at the base is a strong lateral carina.

The antennular peduncle has a broad, obtuse stylocerite. The outer antennular flagellum consists of an eleven-jointed thickened portion terminating in a slender, four-jointed filament; the outer flagellum is slightly longer than the inner and is made up of about 25 segments.

The blade of the broad antennal scale considerably surpasses the outer spine.

The flattened terminal joint of the third maxilliped is armed with a row of stout spines at the tip. The exopod is short.

The first segment of the carpus of the second leg is about two-thirds as long as the second and slightly shorter than the third. The chela is a little shorter than the sum of the first two carpal joints. The propodus of the



Text-figure 7.

Latreutes, sp. **a.** Rostrum. **b.** Antero-lateral margin of carapace. **c.** Antennule. **d.** Antennal scale. **e.** First leg. **f.** Second leg. **g.** Third leg. **h.** Mandible.

third leg is armed with five pairs of spines on the posterior margin and the dactyl is armed with six spines and has a fairly well developed "heel."

The telson bears two pairs of dorso-lateral and three pairs of terminal spines.

Local Distribution: One very much mutilated ovigerous female without a rostrum and the rostrum and anterior part of the carapace of a second specimen were taken from an American Eared Grebe at Santa Inez on April 9. (Cat. No. 36,1079).

Remarks: This species seems to be most closely allied to *L. mucronatus* (Stimpson) and *L. porcinus* Kemp in its general appearance, but it differs from them in having the blade of the antennal scale very broad and longer than the outer spine.

It is with great hesitancy that any mention is made of these specimens, due to their extremely poor condition, but since this is apparently the first time any species of this genus has been taken on the west coast of North America, it may be worthwhile to acquaint collectors with the existence of such a species and so encourage a search for more perfect specimens.

PROCESSIDAE.

Processa canaliculata Leach.

Processa canaliculata Leach, W. R., *Mal. Podophth. Brit.*, pl. 41 and corresponding text, 1815.

Processa canaliculata Lebour, M. V., *Proc. Zool. Soc. London*, pt. 3, p. 612, pls. 1 to 4, 1936.

General Range: Uncertain. Coasts of England; probably also West Indies and west coast of America from San Diego to Panama Bay to a depth of 182 fathoms; possibly widely distributed in offshore waters of both Atlantic and Pacific.

Local Distribution: A total of three specimens was taken from Magdalena Bay in half a fathom, under stones, and at Arena Bank (Station 136) in 45 and 55 fathoms, on muddy bottoms.

Sex and Size: The small female from Magdalena Bay is 16 mm. long (carapace, 4.7 mm.); the female from Station 136 is 26 mm. long (carapace, 7.2 mm.); and the male has a length of 24 mm. (carapace, 6.7 mm.).

Remarks: There is little doubt that the two specimens from Station 136 belong to this species as they agree in practically every particular with Miss Lebour's description. The small specimen from Magdalena Bay, however, differs in having no spines on the meri of the third legs. As it agrees with the other specimens in all other particulars, it seems best to await further specimens from the shallow waters of this coast before assuming that this distinction warrants specific designation. There is a distinct antennal spine in all three specimens.

Material: *Shore of Magdalena Bay*: (1 ♀). *Station* 136: D-4 (1 ♀), D-9 (1 ♂). Cat. Nos. 36,1080, 36,1081.

PALAEMONIDAE.

Palaemon ritteri Holmes.

Palaemon ritteri Holmes, S.J., *Proc. Calif. Acad. Sci.*, ser. 2, vol. 4, p. 579, pl. 21, figs. 29-35, 1895.

Palaemon ritteri Schmitt, W.L., *Univ. Calif. Pub. Zool.*, vol. 23, p. 35, fig. 21, 1921.

General Range: San Diego, California, to Gulf of California; Bay of St. Elena, Ecuador. Shallow water.

Local Distribution: A total of seven specimens was taken at Magdalena Bay and Santa Inez, at depths of 1 to 3 feet, under stones.

Sex and Size: The two males have a length of about 27.5 mm. (carapace, 4.9 mm.), the non-ovigerous females range from 28 to 30.5 mm. in length (carapace, 5 to 5.9 mm.) and the single ovigerous female, from Santa Inez, is 33 mm. long (carapace, 6.8 mm.).

Material: *Magdalena Bay*: (2 ♂, 4 ♀). *Santa Inez Bay*: (1 ♀). Cat. Nos. 36,1082, 36,1083. A male and a female are deposited in the collections of the Museum of Comparative Zoology, Cambridge, Massachusetts (M. C. Z. Cat. No. 9,502).

Periclimenes (Periclimenes) infraspinis (Rathbun).

Urocaris infraspinis Rathbun, M.J., *Proc. U.S. Nat. Mus.*, vol. 24, p. 903, 1902.

Urocaris infraspinis Schmitt, W.L., *Univ. Calif. Pub. Zool.*, vol. 23, p. 37, fig. 22, 1921.

General Range: San Diego Bay, California, and Gulf of California. Shallow water.

Local Distribution: A total of 14 specimens was taken from Santa Inez Bay (Station 144) both with the dredge in three fathoms, on a sandy bottom with abundant weed, and taken from the stomach of a male American Eared Grebe.

Sex and Size: Seven of the females from the Grebe are ovigerous. The carapaces of these specimens vary from 3.1 to 3.7 mm. The non-ovigerous females have a carapace length of 3.2 to 4 mm. The carapace length of the males is from 2.3 to 3.1 mm.

Color in Life: Semi-translucent, pale brown.

Material: *Station* 144: D-7 (1 ♀). *Santa Inez Bay, in stomach of male American Eared Grebe*: (4 ♂, 9 ♀). Cat. Nos. 36,1084, 36,1085. A male and a female are deposited in the collections of the Museum of Comparative Zoology, Cambridge, Massachusetts (M. C. Z. Cat. No. 9,503).

Periclimenes (Ancylocaris) holmesi Nobili.

Anchista tenuipes Holmes, S.J., *Occas. Pap. Calif. Acad. Sci.*, vol. 7, p. 216, 1900. (Not *P. tenuipes* Borradaile).

Periclimenes holmesi Nobili, G., *Ann. Mus. Univ. Napoli* (N.S.) vol. 2, no. 21, p. 5, 1907.

Periclimenes (Ancylocaris) holmesi Kemp, S., *Rec. Ind. Mus.*, vol. 24, p. 218, 1922.

General Range: From Santa Catalina Island, California, to Gulf of California. Shallow water.

Local Distribution: A total of eight specimens was taken from Magdalena Bay, San Lucas Bay and Santa Inez Bay in one-half to 20 fathoms, on sandy bottoms with weed.

Sex and Size: With the exception of the two specimens from Station 141 all of the females are ovigerous. They are from 14.5 to 19 mm. long (carapace, 2.9 to 4 mm.). The non-ovigerous females have a carapace length of 3.6 to 4.3 mm. The single male is 17 mm. long with a carapace length of 3.2 mm.

Color in Life: Semi-translucent, pale brown.

Remarks: The following characters readily distinguish this species from *P.* (*A.*) *elegans* (Paulson) as described and figured by Kemp. The terminal spine of the basal antennular joint is short, falling far short of the distal

half of the second joint. The latter is much more slender than in *P.* (*A.*) *elegans*. The antennal scale is only about three and two-thirds times as long as wide as compared with four and one-half to five and one-half times the width in the Indian species. The first legs extend beyond the antennal scale by the length of the chela. The spine at the end of the merus of the second legs is short and blunt, only slightly more acute than a right angle. Finally, the fifth legs extend to the tip of the antennal scale in all specimens and they may extend beyond it by as much as the dactyl and half of the propodus. In the specimens at hand there are seven or eight dorsal and three ventral teeth on the rostrum.

Material: *Shore of Magdalena Bay*: (1 ♀). *Station* 135: D-9, D-10 (1 ♂, 1 ♀), D-18 to D-25 (1 ♀). *Station* 141: D-2, D-3 (2 ♀). *Station* 144: D-4, D-6 (2 ♀). Cat. Nos. 36,1086 to 36,1089 inclusive. One specimen is deposited in the collections of the Museum of Comparative Zoology, Cambridge, Massachusetts (M. C. Z. Cat. No. 9,504).

Periclimenes (Ancylocaris) lucasi, sp. nov.

(Text-figure 8).

Type: Holotype female, Cat. No. 36,1090, Department of Tropical Research, New York Zoological Society. From Station 135 D-18 to D-25, San Lucas Bay, Lat. 22° 53′ N., Long. 109° 54′ W., 3 to 9 fathoms, May 7, 1936.

Diagnosis: Hepatic but no antennal spine. Rostrum falls short of third antennular segment, ascendent, deep, ventrally straight, dorsally convex, armed with 8 to 11 dorsal and 1 to 3 ventral teeth. Sixth abdominal somite fully twice as long as fifth. Distal spine of antennal scale does not attain end of blade. Merus of second leg falls short of tip of antennal scale and is unarmed at distal end of lower margin. Carpus of larger leg of second pair about half as long as chela, that of smaller almost as long as chela.

Description: The carapace is very short, little longer than the sum of the first two abdominal somites. The antennal spine is well-marked, but small, not reaching the narrowly rounded lower angle of the orbit. The hepatic is somewhat larger and more prominent. There are no supraorbital spines.

The rostrum is strongly ascendent and, although it is about as long as the carapace, it does not attain the level of the third segment of the antennular peduncle. It is about one-fourth as deep as long. The dorsal margin is convex and the ventral straight or even slightly concave. There are from 8 to 11 dorsal teeth of which one or two are behind the orbit and the ventral edge is provided with from one to three inconspicuous denticles near the tip.

All of the abdominal somites are smoothly rounded on the dorsal surface although the third is compressed into a cap-like hump overlapping the base of the fourth segment. The sixth segment is a little more than twice as long as the preceding and the telson is about as long as the sixth somite. The telson bears two pairs of minute dorso-lateral spines, the anterior pair situated about two-fifths of the telson length from the end and the posterior pair midway between the first pair and the tip. There are three pairs of terminal spines, the outer pair minute and the median pair somewhat smaller than the large intermediate pair.

The eyes are slightly wider than the long stalks.

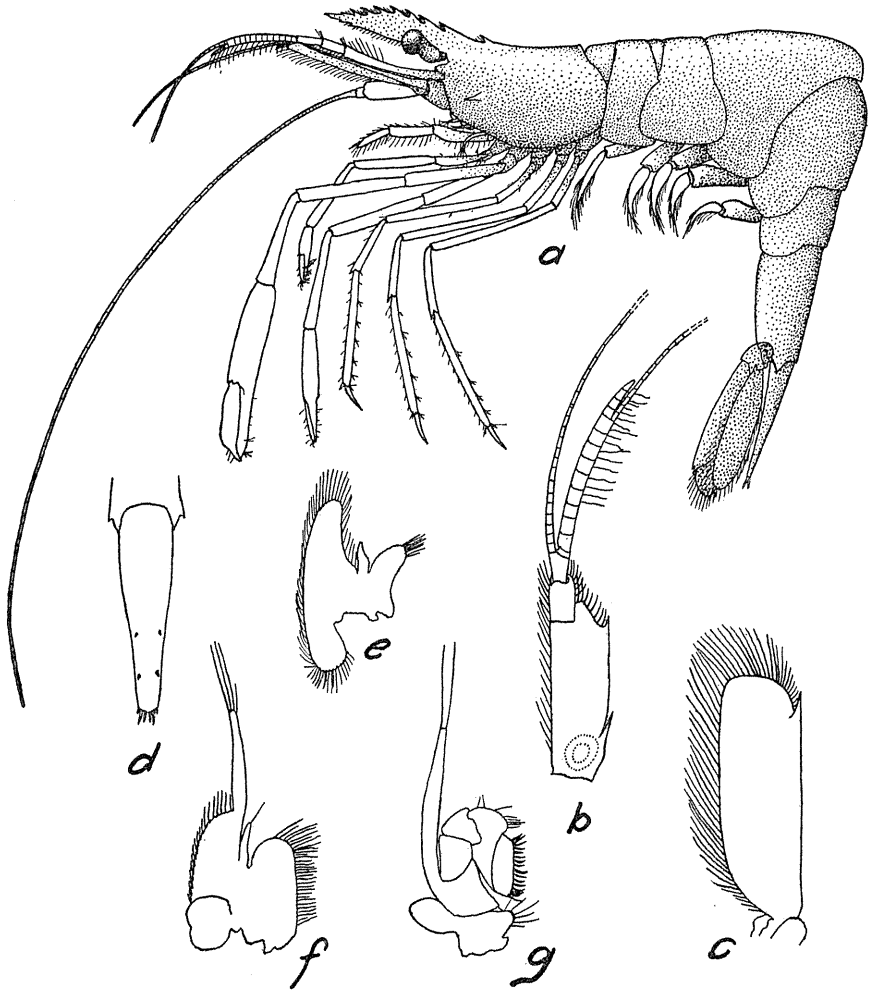
The second segment of the antennular peduncle is considerably longer than the terminal one. The basal segment is produced into a terminal lobe which extends halfway along the outer margin of the second segment, but the outer margin of this lobe recedes rapidly in a sinuous curve to the outer terminal spine which is consequently set well behind the end of the lobe. The outer flagellum forks at the tenth segment and the inner branch is made up of four segments.

The margins of the antennal scale are subparallel for the most part and

the broadly truncate end of the lamellate portion extends well beyond the outer spine.

In comparison with the thoracic legs, the external maxillipeds are quite feeble; they extend about to the tips of the eyes when the latter are turned forward. All three maxillipeds are provided with exopods.

The first pair of legs reaches beyond the antennal scale by about half the length of the chelae. The second legs are subequal. The larger extends beyond the antennal scale by the length of the chela and two-thirds of the carpus. The latter is more than twice as long as the chela and the fingers are about three-fourths as long as the palm. The dactyl is laterally expanded in its distal half. The smaller leg of this pair overreaches the antennal scale by the length of the chela and half of the carpus, the carpus is but little shorter than



Text-figure 8.

Periclimenes (*Ancylocaris*) *lucasi*, sp. nov. **a.** Female holotype. **b.** Antennule of paratype. **c.** Antennal scale of paratype. **d.** Telson of paratype. **e.** Second maxilla of paratype. **f.** First maxilliped of paratype. **g.** Second maxilliped of paratype.

the chela and the dactyl is not expanded. Each of the propodi of the third and fourth legs has six slender spinules on the lower margin, and that of the fifth leg has five. The dactyls of these legs are almost one-fourth as long as the propodi. The fourth leg extends beyond the antennal scale by the length of the dactyl and one-half of the propodus.

The holotype is about 24 mm. long, of which the carapace measures 3.8 mm. and the rostrum 3.8 mm.

Local Distribution: A total of five specimens was taken from San Lucas Bay (Station 135) and Arena Bank (Station 136) between 3 and 45 fathoms, on sandy and muddy bottoms.

Sex and Size: The single male is about 19 mm. long (carapace, 2.9 mm.) and the females, none of which are ovigerous, are from 22.5 to 24.5 mm. long (carapace, 3.3 to 4.1 mm.).

Color in Life: A specimen from San Lucas was plain, semi-translucent white.

Remarks: The male differs from the females in having the second legs subequal and similar. Whether this may be due to the small size of the specimen or no cannot be determined at present. Kemp (*Rec. Ind. Mus.*, vol. 24, p. 181, 1922) has shown that in at least one related species of the genus, *P.* (*A.*) *diversipes* Kemp, four distinct types of second legs may be encountered.

As Kemp has stated, it is impossible at present to decide which are the more important characters in the species of this genus and the species to which *P.* (*A.*) *lucasi* is most closely related can only be conjectured. According to Kemp's extremely helpful key, this species would fall near *P.* (*A.*) *diversipes*, but it is distinguished at once from that species by the sharply ascendent rostrum, the form of the antennules, and antennal scale and the longer thoracic legs.

Material: *Station* 135: D-11 and D-12 (1 ♂, 1 ♀), D-18 to D-25 (2 ♀). *Station* 136: D-1 (1 ♀). Cat. Nos. 36,1090 (holotype); 36,1091, 36,1092 (paratypes). A female paratype is deposited in the collections of the Museum of Comparative Zoology, Cambridge, Massachusetts (M. C. Z. Cat. No. 9,505).

Harpilius depressus Stimpson.

Harpilius depressus Stimpson, W., *Proc. Acad. Nat. Sci., Phila.*, p. 38 (1860) 1861.

Harpilius depressus Kemp, S., *Rec. Ind. Mus.*, vol. 24, p. 231, figs. 69 to 71, 1922.

General Range: Red Sea, Seychelles, Minikoi, Maldives, Chagos Archipelago, Loyalty Islands, Rotuma and the Hawaiian Islands, in coral.

Local Distribution: One specimen (Cat. No. 36,1093) in poor condition was taken off Arena Bank (Station 136 D-33) at a depth of 2½ fathoms, in coral (*Pocillopora ligulata*) on May 2, 1936. This specimen is about 15 mm. long (carapace, 3.2 mm.).

Remarks: This specimen approaches Kemp's variety *gracilis* in having the anterior pair of telson spines placed much behind the middle of the telson and the posterior pair about equidistant between the first pair and the apex. Likewise, the second leg is more slender than that described as the typical form by Kemp, the merus being three and one-half times as long as wide and the palm about four times as long as wide. The rostrum has seven dorsal and three ventral teeth.

This is apparently the first time this species has been taken east of the Hawaiian Islands.

Pontonia margarita Smith.

Pontonia margarita Smith, S.J., in Verill, A.E., *Am. Naturalist,* vol. 3, p. 245, 1869.

Pontonia margarita Kemp, S., *Rec. Ind. Mus.,* vol. 24, p. 287, 1922.

General Range: Gulf of Panama and Gulf of California.

Local Distribution: A total of nine specimens was taken at San Domingo Point, in the Inez area, and on Pulmo Reef from pearl oysters, collected at depths of from one to two fathoms.

Sex and Size: The males have a total length of from 18.5 to 21 mm. (carapace, 5.9 to 6.7 mm.); two ovigerous females from San Domingo Point have a total length of about 26 mm. (carapace, 8.2 and 8.9 mm.); and the non-ovigerous females are from 20.5 to 24 mm. long (carapace, 6.2 to 7.2 mm.).

Remarks: Inasmuch as the genus *Conchodytes* Peters differs from *Pontonia* only in having a basal protuberance on the dactyls of the last three thoracic legs, a distinction which is certainly of no greater importance than that between the simple and biunguiculate dactyls of species which have been commonly referred to *Pontonia,* it seems to me that little is to be gained by retaining *Conchodytes.* The basal protuberance of the dactyls in the latter genus varies from a large, toothed structure in such species as *C. biunguiculatus* (Paulson) and *C. nipponensis* (de Haan) to an unarmed, rounded lobe in *C. tridacnae* Peters and *C. meleagrinae* Peters and finally to a lobe so inconspicuous in *C. margarita* that Kemp was led to place that species in the genus *Pontonia.* It is therefore my opinion that all of the species constitute a single natural group closely allied to, but probably generically distinct from, *Anchistus* Borradaile and separated from the remaining genera of the Pontoniinae by several important characters.

Material: *San Domingo Point*: (3 ♂, 4 ♀). *Pulmo Reef*: (1 ♂, 1 ♀). Cat. Nos. 36,1094, 36,1095. A male and a female are deposited in the collections of the Museum of Comparative Zoology, Cambridge, Massachusetts (M. C. Z. Cat. No. 9,506).

CRAGONIDAE.

Crago zacae, sp. nov.

(Text-figure 9).

Type: Holotype female, Cat. No. 36,1096, Department of Tropical Research, New York Zoological Society. From Station 125, D-1, east of Cedros Island, Lat. 28° 13′ N., Long. 115° 07′ W., 44 fathoms, on a muddy bottom, March 27, 1936.

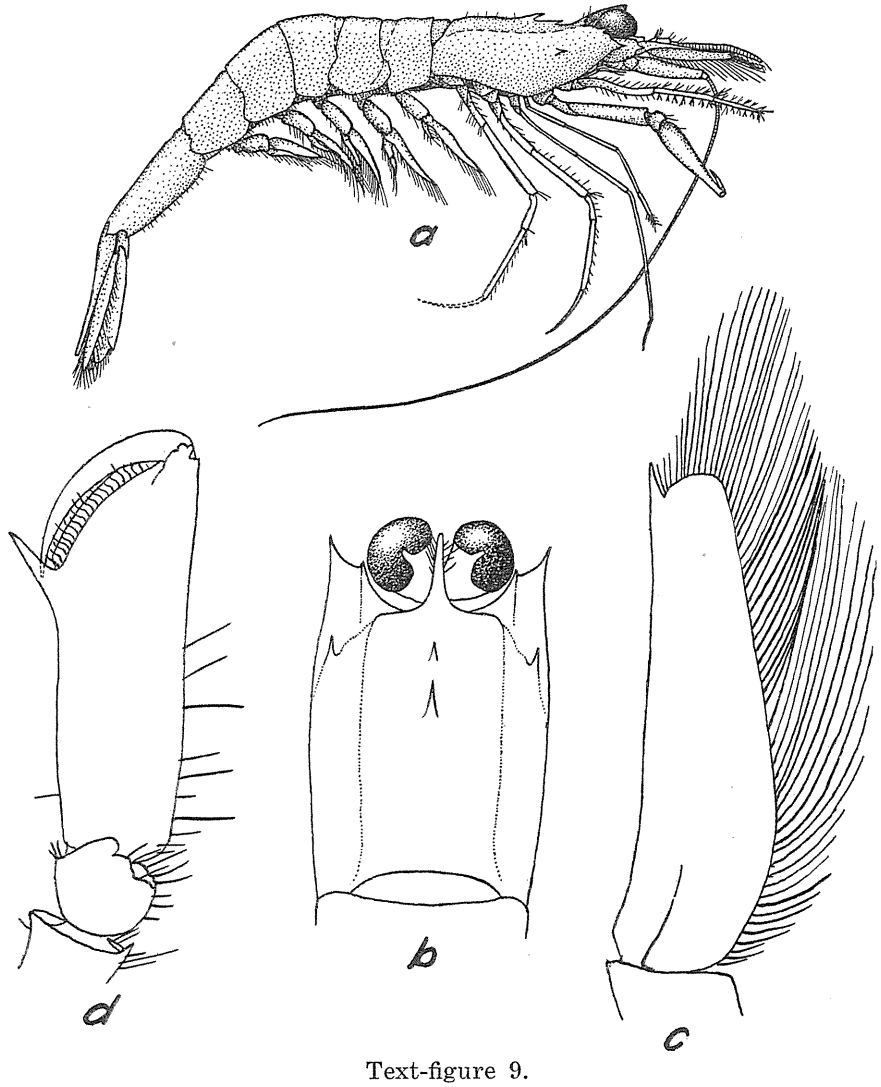
Diagnosis: Gastric region not depressed below general outline of carapace. Two spines on dorsal midline of carapace, the posterior in front of midpoint of carapace. A pair of lateral spines in line with anterior dorsal spine. Rostrum moderately ascendent, narrowly rounded at tip and not reaching as far forward as eyes. Abdomen with no carina on first five somites, sixth somite with parallel carinae divided by a median sulcus. Blade of antennal scale exceeded by outer spine. Chelae of first legs more than three times as long as wide.

Description: The carapace to the base of the rostrum is about one-fourth as long as the abdomen. The gastric region is not depressed below the general outline of the carapace. There are two spines in the dorsal midline, the posterior one much the longer and arising in front of the middle of the carapace. There is a strong lateral spine in line with the anterior dorsal one. On the anterior margin there are two spines, one at the lower orbital angle, the other at the antero-lateral angle of the carapace.

The rostrum ascends at a slight angle which varies somewhat, but never becomes as great as 45 degrees. It has a pronounced dorsal sulcus and tapers to a blunt point which never reaches as far forward as the eyes.

The abdomen is without trace of a carina on the first five somites. The posterior portions of the first two segments are slightly elevated, the elevations being preceded by broad, shallow, transverse sulci. The sixth segment, which is about one and two-thirds times as long as the fifth, bears a pair of dorsal longitudinal carinae separated by a median sulcus and bounded on the outer side by shallower sulci. The telson is longer than the sixth somite and bears two pairs of dorso-lateral spinules.

The eyes are large and black.



Text-figure 9.

Crago zacae, sp. nov. **a.** Female holotype. **b.** Dorsal view of carapace of holotype. **c.** Antennal scale of paratype. **d.** Hand of first leg of paratype.

The second segment of the antennular peduncle is about twice as long as the third. The flagella extend to the ends of the hairs which fringe the antennal scale. The latter is a little more than three and one-half times as long as wide and the outer spine easily exceeds the blade.

The third maxillipeds extend slightly beyond the antennular flagella. The first legs exceed the antennal scale but do not reach as far as the terminal fringe of the latter. There is a spine at the outer angle of the distal end of the merus. The palm is almost three and one-third times as long as wide and the dactyl closes quite obliquely. The second pair of legs is shorter than the first. The third pair extends well beyond the third maxillipeds and the fourth falls just short of the latter.

The eggs are of medium size.

The holotype is 20.5 mm. long, of which the carapace measures 3.7 mm. and the sum of the carapace and rostrum 4.8 mm.

Local Distribution: A total of 19 specimens was taken from east of Cedros Island (Station 125) and from Gorda Banks (Station 150) between 40 and 100 fathoms, on muddy and rocky bottoms.

Sex and Size: Five of the females, including the single specimen from Station 150, are ovigerous. They range in length from 20 to 26.5 mm. (carapace, 3.7 to 5.2 mm.). The non-ovigerous females are from 19.5 to 23 mm. long (carapace, 3.2 to 4.3 mm.). The males vary between 18 and 24.5 mm. in length (carapace, 3.3 to 4.5 mm.).

Color in Life: Body semi-translucent, mottled finely with greenish-brown and scarlet on dorsal and lateral surfaces; ventral surface white. Antennae banded with scarlet and white; eye mottled greenish and black; uropods and telson same color as body; remaining appendages translucent white.

Remarks: This species belongs to the group made up of *C. communis* (Rathbun), *C. resima* (Rathbun) and *C. abyssorum* (Rathbun). It is distinguished from the last by the smaller eyes, longer palm of the first leg and lack of a carina on the fifth abdominal somite. It differs from *C. resima* in the differently shaped and less ascendent rostrum and longer palm. The present species most closely resembles *C. communis,* which is supposed to range from the Bering Sea to San Diego, California. It apparently differs from that species in the total absence of a carina on any but the sixth segment of the abdomen. Also, although the palm of the first legs has about the same proportions as that of *C. communis,* the dactyl closes more longitudinally than in that species as figured by Miss Rathbun. Since all of the *Zaca* specimens are small and since the smallest of these show no trace of the parallel carinae on the sixth segment, it might be suggested that the other abdominal carinae had not yet become apparent. However, there are six male specimens of the same species in the Museum of Comparative Zoology which are from 34 to 39 mm. in length. They were collected at Monterey Bay, California, August 31, 1936, in 50 fathoms by Dr. Elizabeth Deichmann. These specimens agree in all particulars with the *Zaca* series and show no trace of a carina on any of the first five abdominal somites. Miss Rathbun (1904) mentions two specimens received from the Hopkins Laboratory at Pacific Grove which she referred to *C. communis*. It is probable that these were also dredged in Monterey Bay. Inasmuch as these two species are very similar in appearance, it may be that these specimens belong to *C. zacae*. Since this species has been taken at three such distant points as Monterey Bay, Cedros Island and Gorda Banks, future research may reveal that this is the southern form of *C. communis*.

Material: Station 125: D-1 (3 ♂, 15 ♀). Station 150: D-5 (1 ♀). Cat. Nos. 36,1096 (holotype); 36,1097 to 36,1099 inclusive (paratypes). One male and two female paratypes are deposited in the collections of the Museum of Comparative Zoology, Cambridge, Massachusetts (M. C. Z. Cat. No. 9,507).