

NOTES ON THE CRUSTACEA OF LAGUNA BEACH

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From the character of the coast at Laguna one would expect a rich representation of the crabs, shrimps, prawns, and their allies, and the richness of the crustacean fauna is most forcibly impressed upon one by a little collecting. We took a great number of specimens and species of crustaceans during this first summer, of which but a very small proportion have as yet been worked up, especially among the Entomostraca. A few of these latter I have examined in some detail in cases where they happened to be conspicuous or to occur in great numbers of individuals. Miss Stout has done a considerable amount of work on the Amphipoda of this locality, and Miss Stafford on the Isopoda. They both accumulated a great wealth of material, indicating a littoral fauna of great richness in these groups.

The crabs, but few of which I have determined, are extraordinarily abundant. The tide-pools swarm with them, a stone turned over frequently revealing a half dozen species at one time. One small crab, apparently quite rare, was of peculiar interest because it seemed to be always covered with a dense forest of small simple sponges, perhaps indicating a symbiotic relationship.

A number of species of parasitic copepods (three from one shark) and isopods were taken, but these are as yet undetermined.

MALACOSTRACA

Order DECAPODA

Epialtus productus Randall

The young of the kelp crab are very common in the tide-pools clinging to fucus and other brown alga, but mature specimens are only to be found in the kelp beds.

Loxorhynchus grandis Stimp.

Large carapace shells of this deeper water crab are commonly washed up on the beach.

Cycloxanthops novemdentatus Lock.

Frequent under stones between tides.

Lophopanopaeus leucomanus (Lock.)

(Figure 53)

Occasional under stones between tides. Examination of the appendages of the head of this species, in comparison with those of

Xanthias taylori reveals some interesting resemblances and differences. The mandibles and maxillipeds are strikingly similar. The antennules, however, are very unlike and present some salient characters. The outer flagellum in this species is three-jointed while in *X. taylori* it appears to be seven-jointed. The large tuft of bristles opposite the outer flagellum is as long as the inner in this species, while in *X. taylori* it is only half as long.

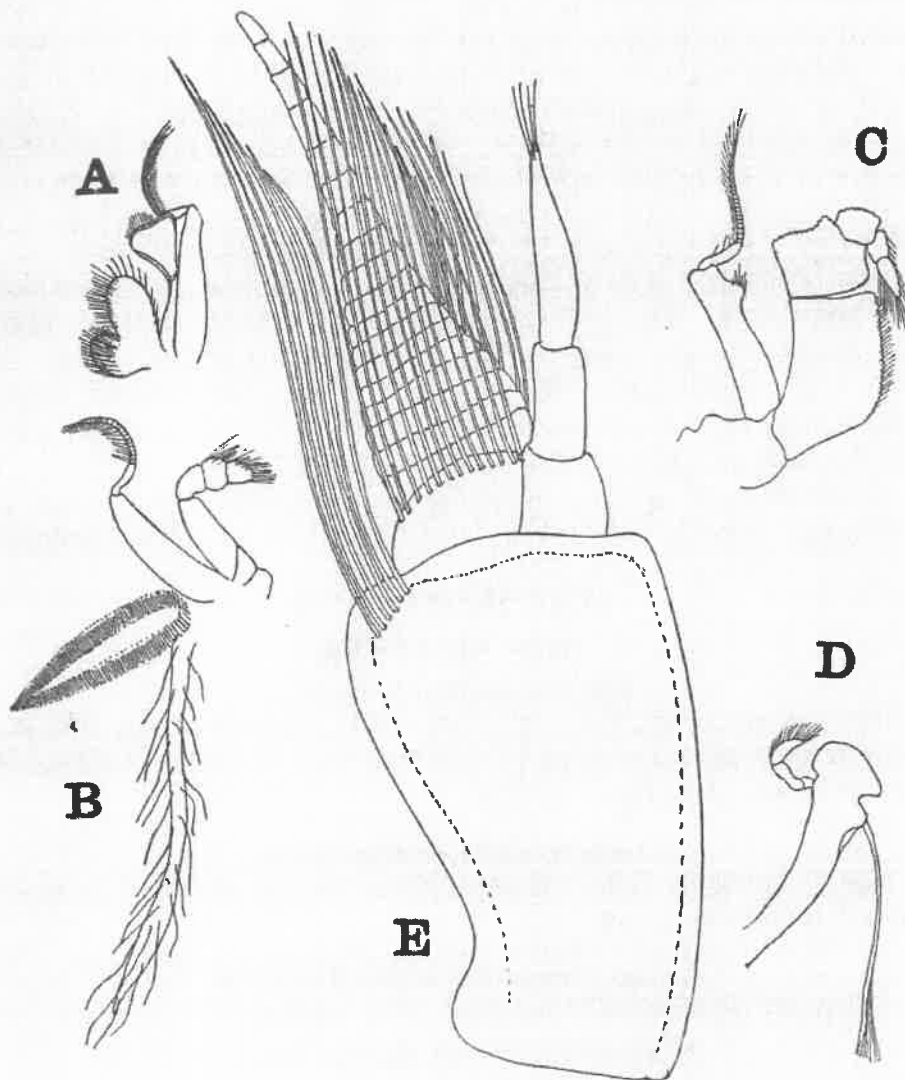


Figure 53. *Lophopanopaeus leucomanus*

A, First maxilliped. B, Second maxilliped. C, Third maxilliped. D, mandible. E, antennule.

Xanthias taylori Stimp.

(Figure 54)

Abundant under stones between tides and also in kelp holdfasts from deeper water.

Pachygrapsus crassipes Randall

This is the very abundant shore crab which is so common scuttling over the stones of the higher beach. It sometimes contains a large parasitic isopod in its branchial cavities.

Randallia ornata (Randall)

Occasional specimens from kelp holdfasts in deeper water.

Eremita analoga (Stimp.)

Exceedingly abundant, burrowing in sand between tides, and much used for bait.

Blepharipoda occidentalis Randall

This large species—one of the most remarkable crustaceans on the coast—is occasional on the sandy shores just below low tide. The boys locate them with their feet while in bathing and dive for them.

Lepidopa myops Stimp.

Occasional in the sand between tides, associated with *Eremita*.

Petrolisthes cinctipes (Randall)

The "flat crab" is common under stones between tides.

Pachycheles rudis Stimp.

Abundant under stones between tides. This little crab with swollen tuberculated chelipeds is also common in kelp holdfasts.

Callianassa longimana Stimp.

Burrowing in the sand underneath stones in the tide-pools. Not common. This loosely built, ghostly looking animal reminds one strongly of certain cave-dwelling animals.

Panulirus interruptus (Randall)

Very common in the deeper waters off shore. This seems to be headquarters for this splendid lobster. We frequently saw large specimens just below low tide, and encountered young specimens frequently in the tide-pools.

Crangon vulgaris L.

Some specimens which cannot be distinguished from the current descriptions of this species, were taken in a bed of *Phyllospadix* just below low tide.

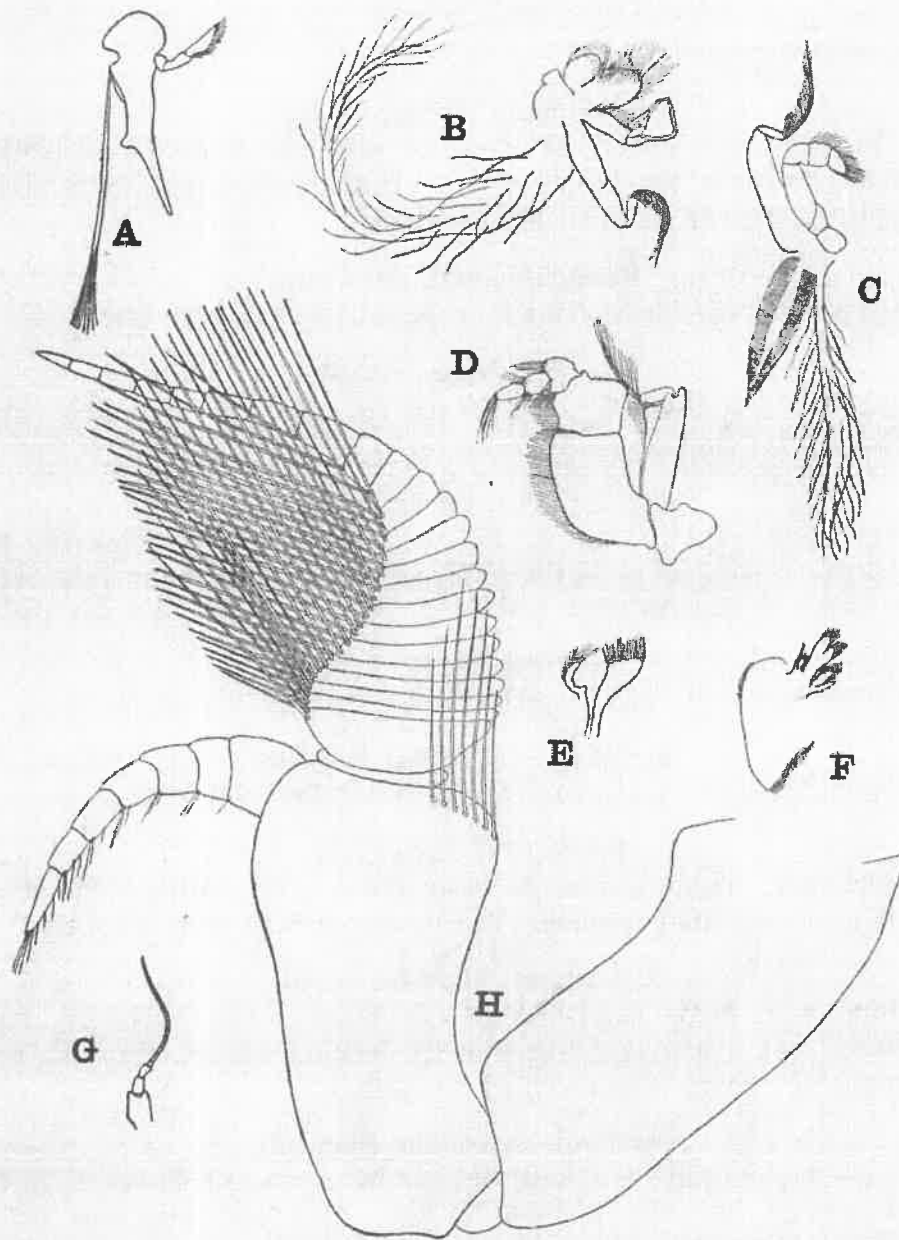


Figure 54. *Xanthias taylori*
A, mandible. B, First maxilliped. C, Second maxilliped. D, Third maxilliped.
E, First maxilla. F, Second maxilla. G, Antenna. H, Antennule.

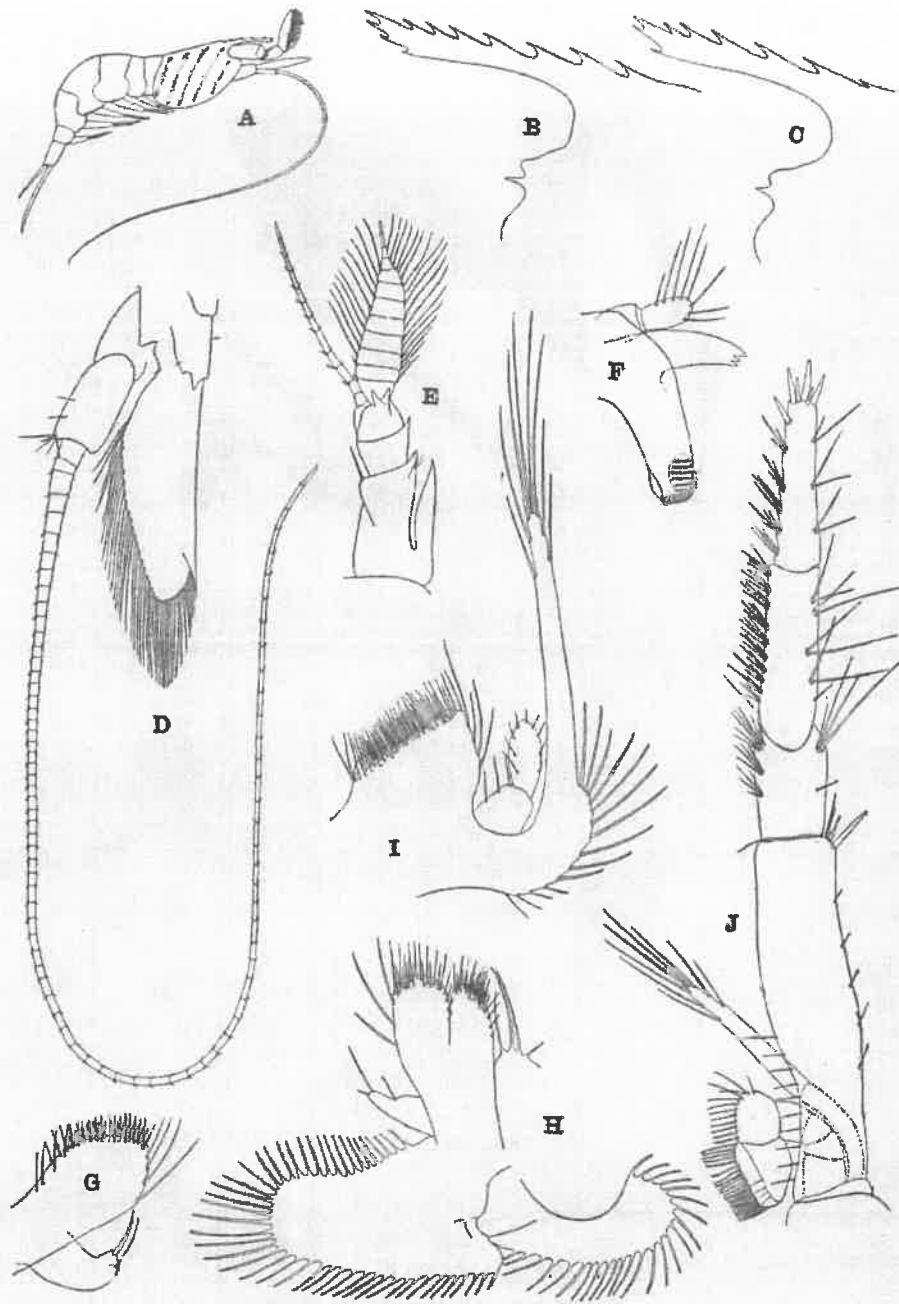


Figure 55. *Heptacarpus pictus*

A, Habit sketch, showing common attitude of body and antennules. B, C, Variation in toothing of rostrum. D, Antenna. E, Antennule. F, Mandible. G, First maxilla. H, Second maxilla. I, Third maxilla. J, Maxilliped.

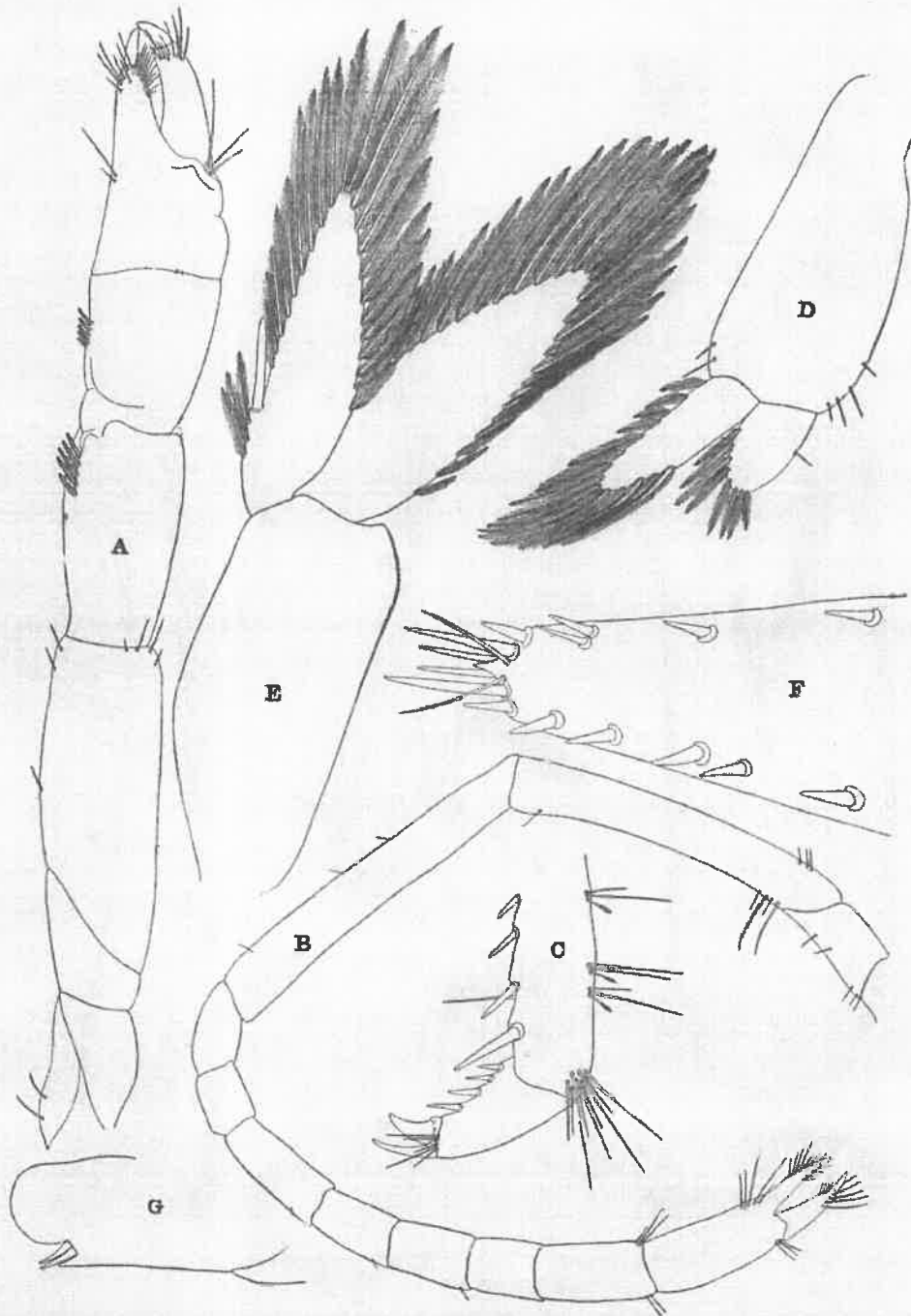


Figure 56. *Heptacarpus pictus*

A, First pereopods. B, Second pereopods. C, Third pereopods. D, First pleopods. E, Second pleopods. F, Apical two-thirds of telson. G, Exopodite of uropod, showing teeth.

Crangon nigromaculatus Sm.

Under stones in sandy bottomed tide-pools. The color is translucent white, peppered with black dots, a larger dot on either side of the fifth and sixth pleon segments. When this species is exposed by the turning over of a stone, it settles immediately into the surface of the sand, and is then almost indistinguishable.

Hippolysmata californica St.

This extraordinarily brilliant Hippolytid with its red stripes is certainly one of the finest things to be found in the tide-pools. We frequently pointed to it as one of the most beautiful marine animals to be found at Laguna.

Alphaeus clamator Lock.

Common in sponge masses and kelp holdfasts.

Betaeus longidactylus Lock.

A very beautiful olive green species, abundant in tide-pools.

Heptacarpus pictus (Stimp.)

(Figures 55 and 56)

This small and very beautiful Hippolytid is abundant in the tide-pools and also outside in the kelp beds. Its greenish semi-transparency, with oblique reddish marks on the pereion, make it wholly inconspicuous—almost invisible—in alga-filled tide-pools. The tow-net, however, quickly reveals it as a very abundant species.

Order TANAIIDACEA

A number of species of these minute tube-dwellers were encountered among the algæ lining tide-pools, and also in kelp holdfasts. They will be worked up later.

Order CUMACEA**Pseudocuma lagunae** n. sp.

(Figure 57)

We were greatly interested to encounter in one of the lower tide-pools a minute *Pseudocuma*. It appears to represent an undescribed form.

Female. Length 1.5 mm. Carapace a little less than one-fifth the total length and nearly as deep as long. Pseudorostrum short, truncate, and not at all elevated. Back of the large eyes is a deep vertical plica standing nearly at right angles to the dorsum and reaching lower border of carapace, giving a remarkable appearance of a separated head. Sides of carapace with three curved ridges. Entire cephalo-thoracic region about as long as remainder of body. Telson equalling basal joint of uropods, and narrowing at the tip to a subacute point. Appendages as illustrated in the figure.

Order MYSIDACEA**Mysis costata** Holmes

This species occurs in inconceivable myriads in the kelp beds just off shore, where Mr. Guernsey took it with the tow net.

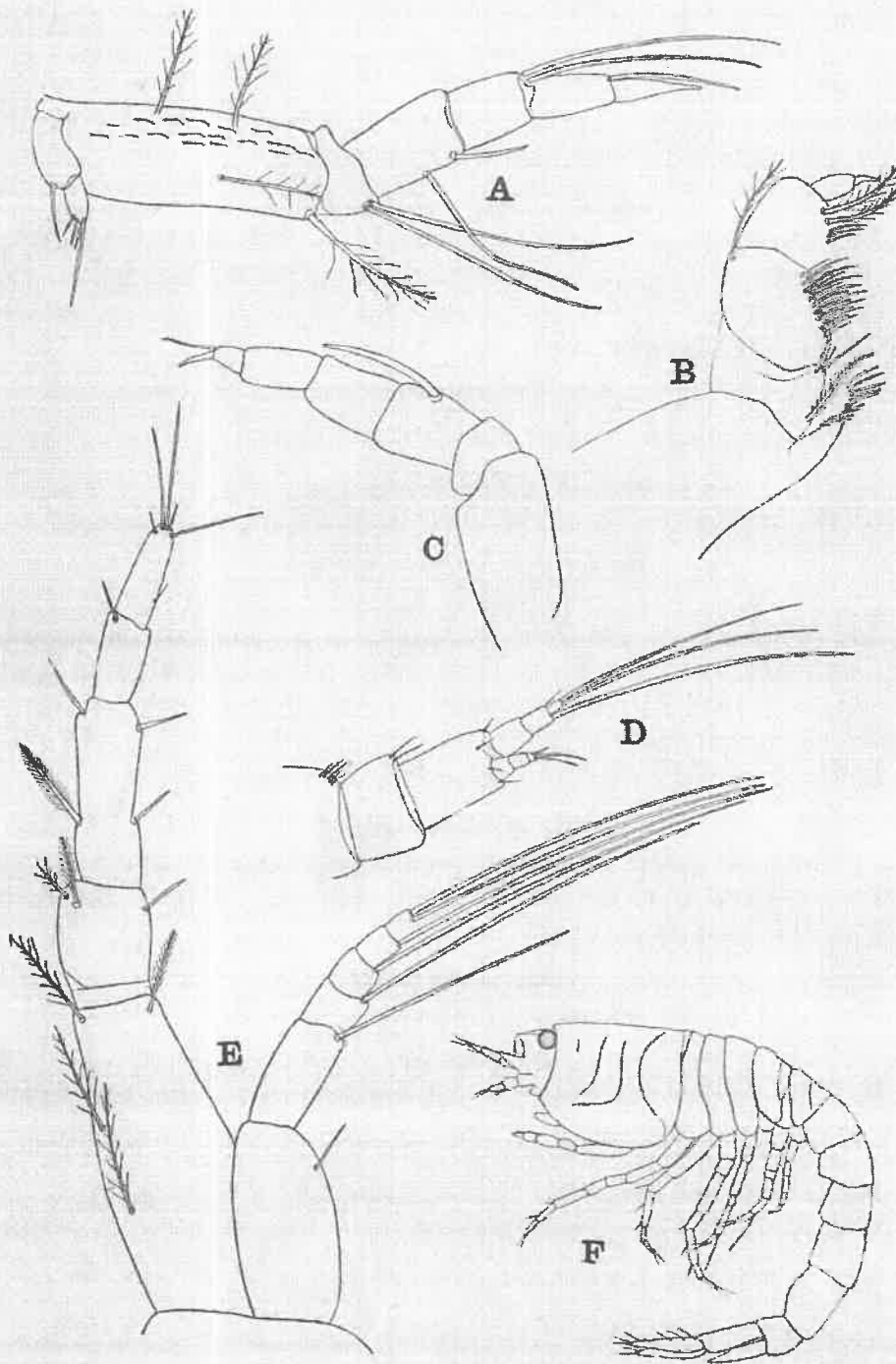


Figure 57. *Pseudocuma lagunae*
A, Third leg, with rudimentary exopodite. B, Third maxilliped. C, Fifth leg.
D, Superior antenna. E, First leg. F, Habit sketch of female.

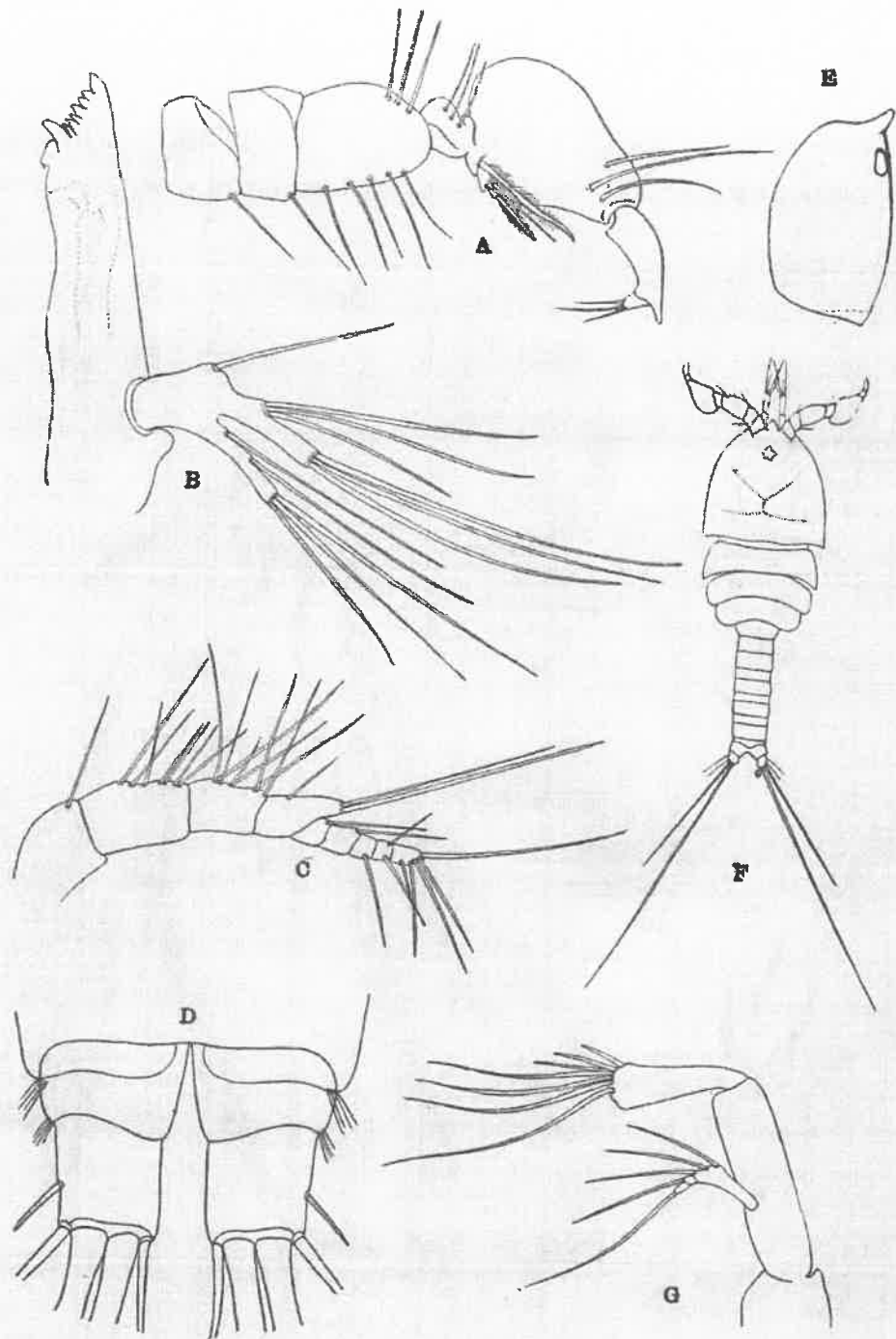


Figure 58. *Tisbe californica*
 A, Antenna of male. B, Mandible, sutures in palp not distinct. C, antenna of female. D, Base of furca. E, Side view of carapace. F, Adult male. G, Antennule.

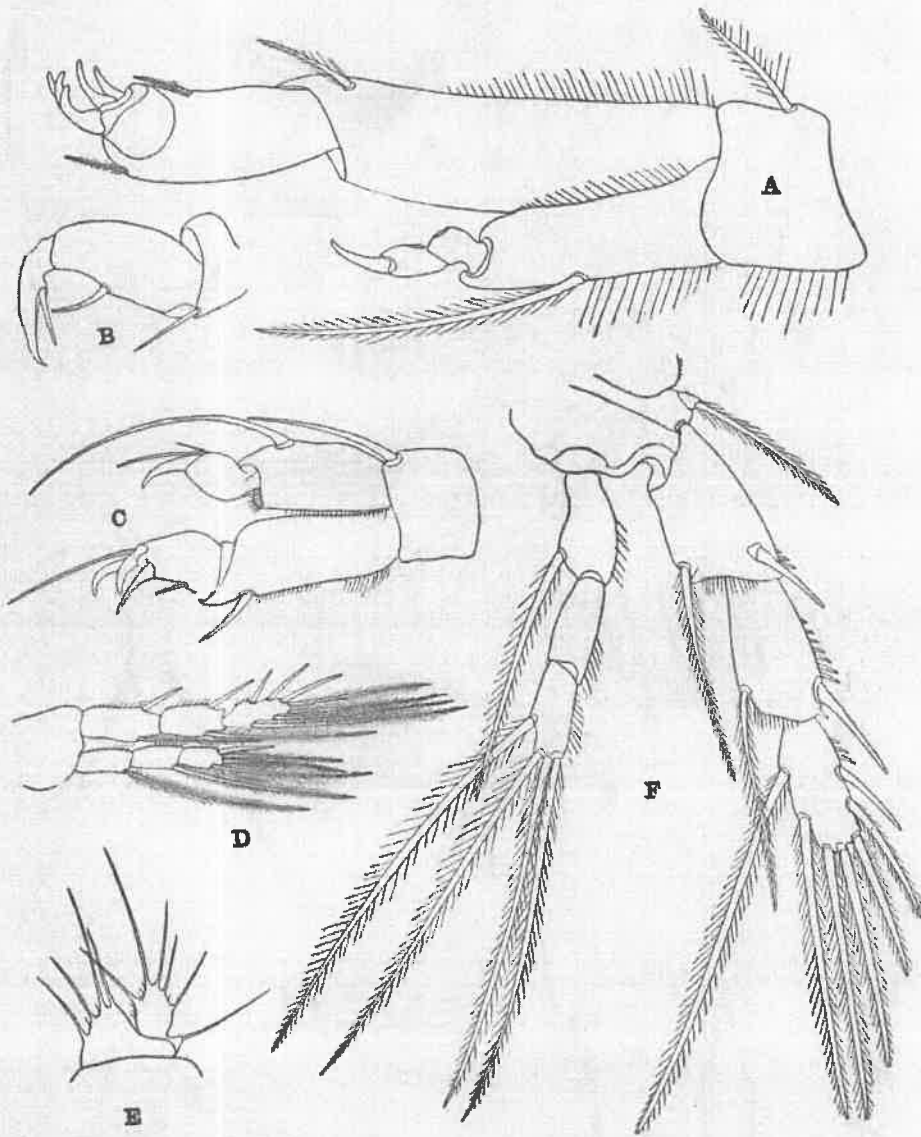


Figure 59. *Tisbe californica*
A, First leg of male. C, First leg of female. D, Penultimate leg. E, Last leg of female. F, Antepenultimate leg.

Subclass CIRRIPIEDIA

Numbers of species of barnacles occur at Laguna and the beginnings of a study of them was made which will be continued later.

Subclass COPEPODA

Tisbe californica n. sp.

(Figures 58 and 59)

During a few weeks in July, some of the high tide-pools remained for days without change of water, and each day became very warm at noontime. Enormous numbers of an apparently red Copepod appeared in these pools. This species appears to me to be a *Tisbe* close to *Tisbe furcata* but differing as follows: The terminal flagellum of the female antenna appears to be five-jointed, the produced angle of the last joint of the basal portion being extended beyond the first joint of flagellum. The setæ of the mandibular palpi are numerous and longer than the palpi. The longest caudal setæ are much longer than abdomen. Other details are shown in the figures.

Diaptomus stagnalis Forbes

(Figure 60)

Harry Hall used the tow-net industriously in the two small ponds in the canyon above Laguna, with rich results. Among other things he took specimens of a colossal *Diaptomus*, which fit the descriptions of *stagnalis* very closely and which correspond with remarkable closeness to the figures of Herrick's *Diaptomus giganteus*, which is considered synonymous with *stagnalis*. The color in eastern specimens appears to be variable. Here it has a semi-transparent body, pale bluish ventrally as are also the feet, and with the antennæ pale yellowish to colorless. DeGuerne and Richard complain that this species was never properly illustrated, so I have tried to prepare a plate for it.

Subclass OSTRACODA

Cyprinotus californicus n. sp.

(Figure 61)

This minute species (length .5 to .8 mm.) was taken by Mr. Hall in considerable numbers in the freshwater ponds with *Diaptomus stagnalis*. Color pale translucent greenish. The shell is thickly covered, especially distally in all directions from the hinge, with minute papillæ bearing fine hairs, which are longer towards the margins. Right valve armed anteriorly with small dark marginal teeth. The four weakly plumose natatory setæ of the second antennæ exceed the longest terminal claws by one-half the length of the

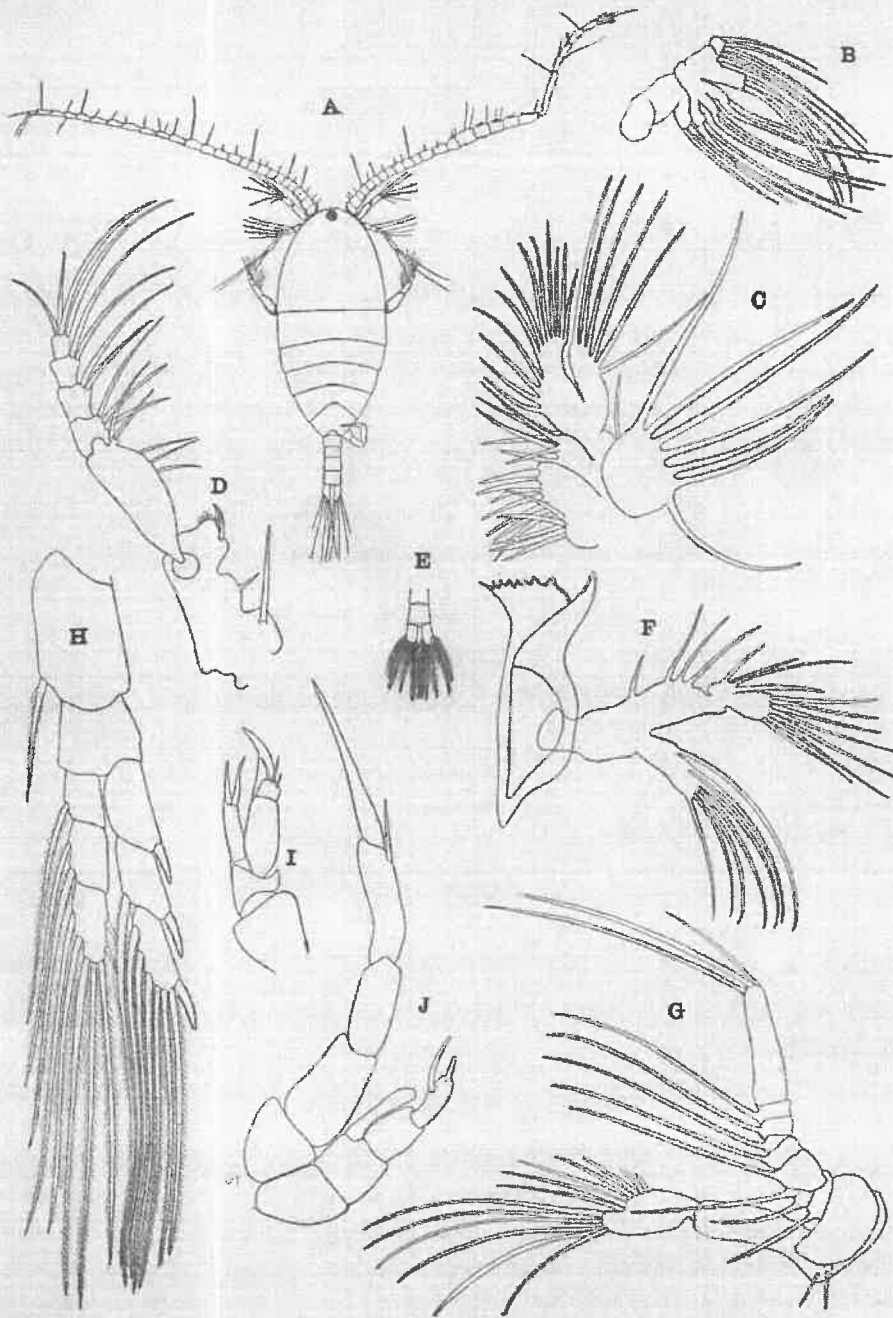


Figure 60. *Diaptomus stagnalis*

A, Habit sketch. B, First maxilla. C, Second maxilla. D, Maxilliped. E, End of abdomen. F, Mandible. G, Antennule. H, Antepenultimate leg of male. I, Last leg of female. J, Last leg of male.

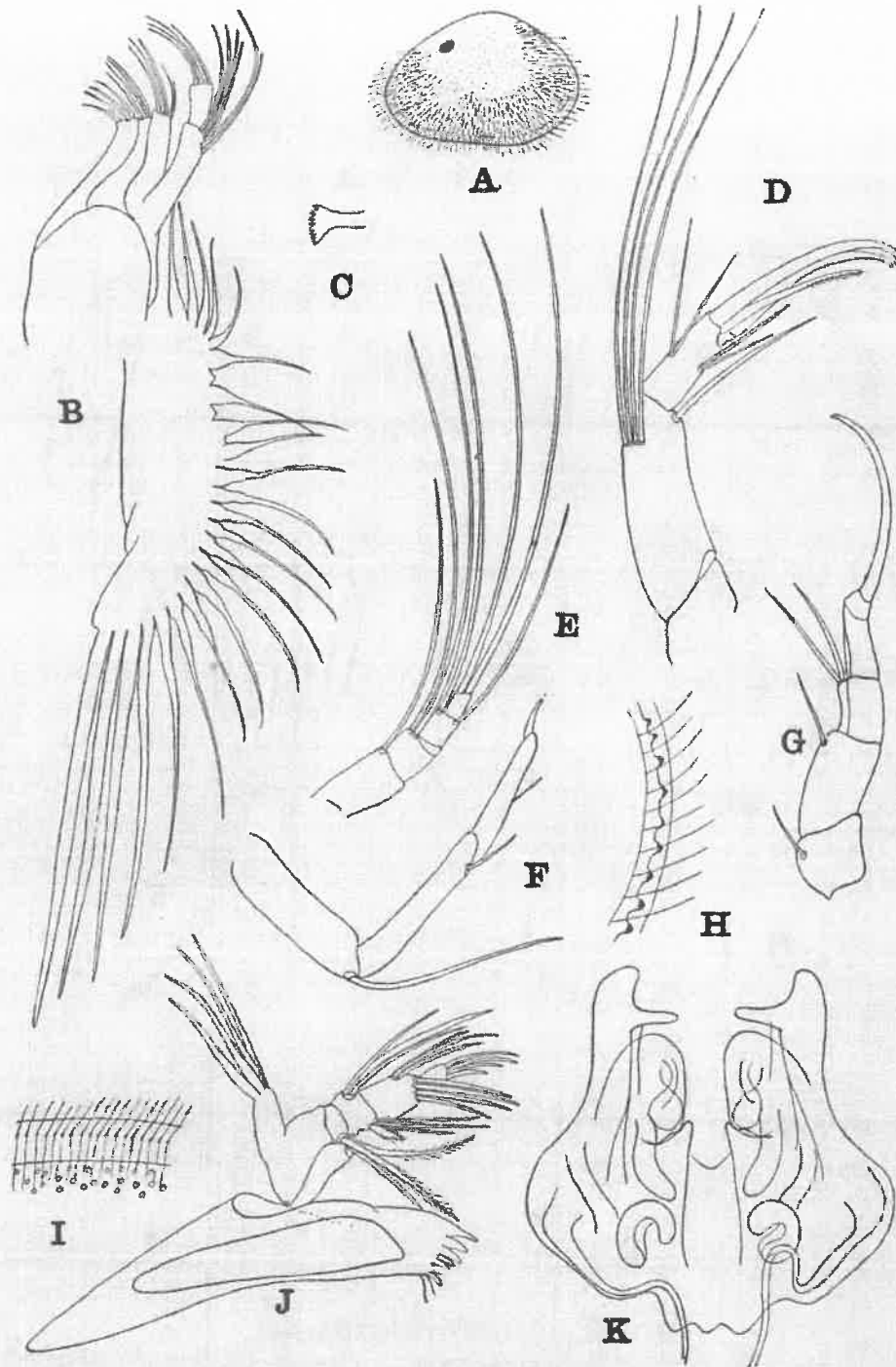


Figure 61. *Cyprinotus californicus*
 A, Habit sketch. B, Maxilla. C, Upper lip. D, Second antenna. E, First antenna. F, Second leg. G, First leg. H, Anterior border of right valve. I, Shell structure on outer margin. J, Mandible. K, Anal armature.

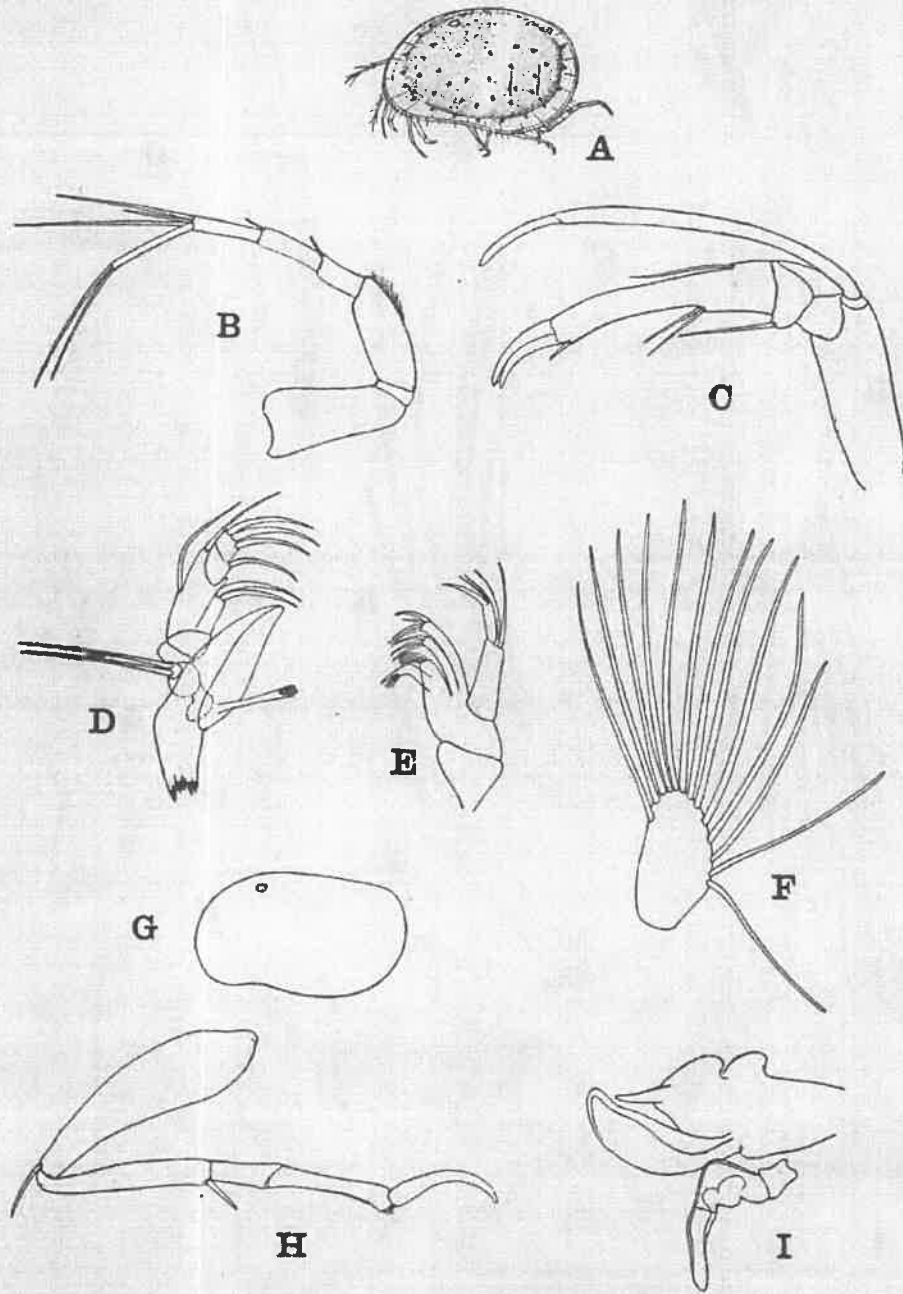


Figure 62. *Xestoleberis transversalis*

A, Adult, habit sketch. B, First antenna. C, Second antenna. D, Mandible with palpus turned backward. E, Maxilla. F, Branchial plate of maxilla. G, Sexual variation in shell outline. H, Second leg. I, Anal armature.

claws (which are not of equal length). The second legs with a cylindrical third joint armed with a short claw, and a small, weak, scarcely longer, recurved seta, which is not shown in the drawing. First legs with the long curved claw nearly as long as the three preceding joints. Branchial plate of mandibular palp with four stout setæ, the branchial plate of first maxillæ with about twenty-three. Other characters may be gathered from the figures. Nearest in general appearance, perhaps, to *Cypris pellucida*.

Xestoleberis transversalis n. sp.

(Figure 62)

A small (.5 to .65 mm.), very pale greenish or brownish, white banded podocopous ostracod is very abundant in tide-pools at Laguna Beach. The characters of anal armature, mandibular palp, second antennæ, and shell structure seem to distinguish it from anything previously described. The shell is very slightly hairy except along distal margin. The disc of the shell is armed with numbers of distinct tubercles, and with a transverse white band at or slightly posterior to middle. First antennæ six-jointed, the penultimate and antepenultimate joints of equal length, longer than third but shorter than the much slenderer last joint; last joint with two spines, penultimate with a tuft of spines at apical angle. Second antennæ with fourth joint not distinctly separated, the outer branch with terminal claw as long as claw of inner branch. The tuft of spines on outer margin of third joint of inner branch nearer base than apex. Mandibles at masticatory margin narrower than at insertion of palpus; palpus with respiratory plate distinctly separated to the base and with two slightly plumose spines, the terminal portion of palpus distinctly two-jointed; two large spines at base of palpus. Second leg with basal joint longer than second, the fourth nearly twice the length of third.

Both this species and the next are placed in *Xestoleberis*, though a new genus might easily be erected for each of them as Esterly has done for *Paracytheroma pedrensis*. These appear, however, to present only specific differences.

Xestoleberis flavescens n. sp.

(Figure 63)

Another podocopous ostracod occurs with *X. transversalis*, but is a slightly larger, and rarer, species. In shell structure, anal armature, and other details it is entirely distinct. The shell is entirely covered with small rounded bosses of peculiar structure, and it is cream colored and translucent throughout. The legs are distinctly yellowish. First antennæ four-jointed, penultimate joint far shorter

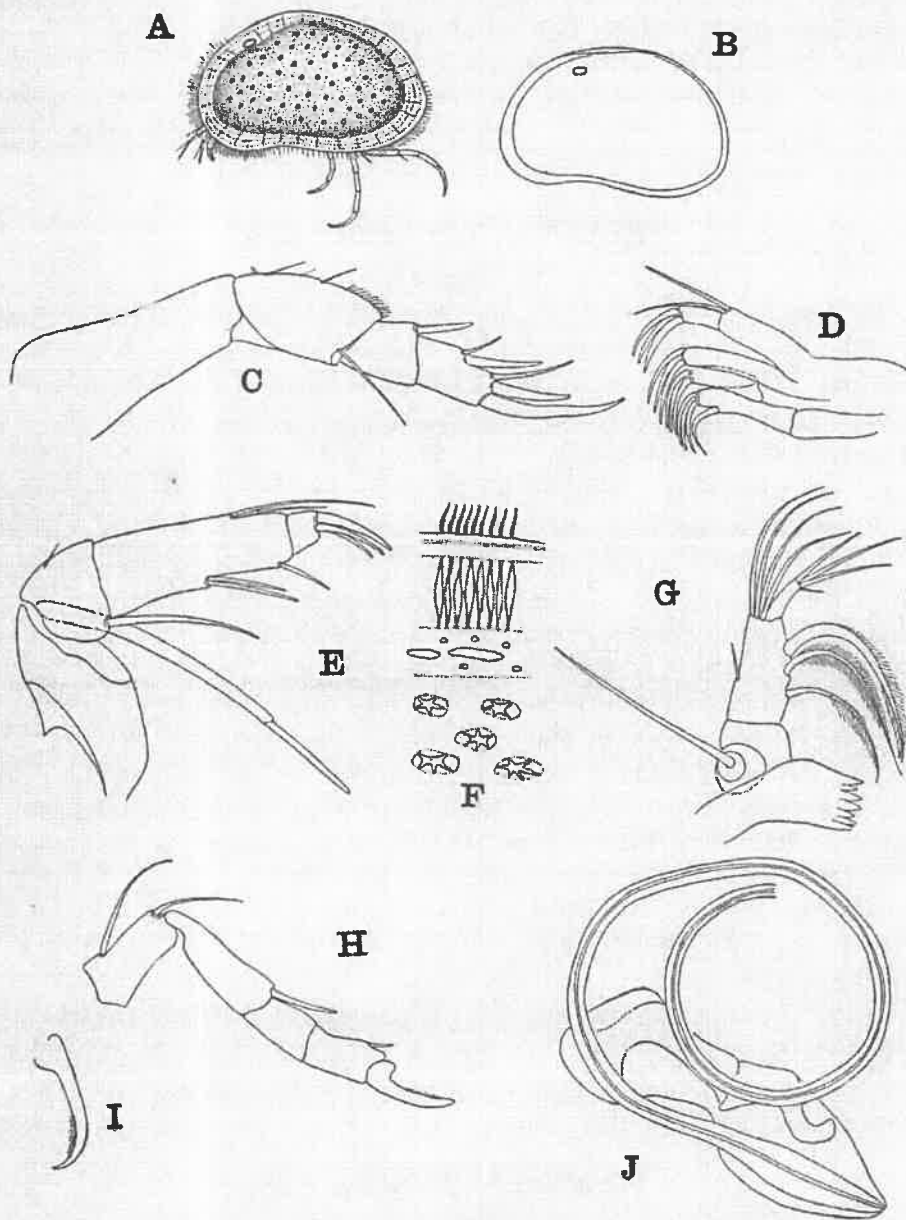


Figure 63. *Xestoleberis flavescens*

A, Adult, habit sketch. B, Sexual variation in outline. C, First antenna. D, Maxilla. E, Second antenna. F, Margin of shell, edge above. G, Mandible. H, Second leg. I, Dactyle of last leg. J, Anal armature.

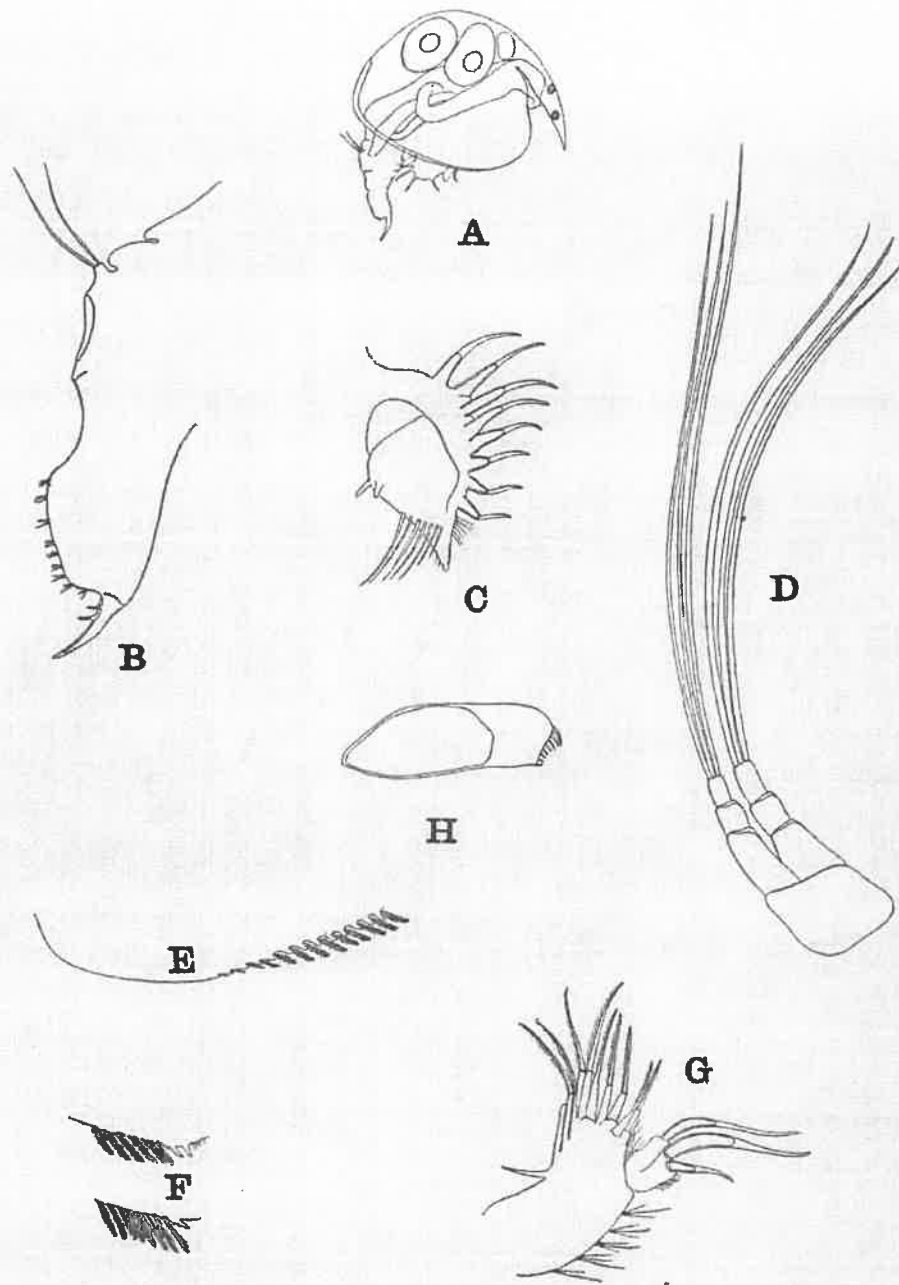


Figure 64. *Chydorus simplex*

A, Adult, habit sketch. B, Postabdomen. C, Second foot. D, Antennule. E, Plumed hairs on posterior distal margin of shell, showing where plumed hairs pass into teeth of anterior angle. G, First foot. H, Mandible.

than antepenultimate and slightly shorter than last; last two joints very heavy and armed with stout spines. Second antennæ with fourth joint distinctly separated, the outer branch with terminal claw longer than claw of inner branch. The tuft of spines on outer margin of third joint of inner branch, nearer to apex than base. Mandibles at masticatory margin broader than at insertion of palpus; palpus with respiratory plate not distinctly separated, but its three spines are large, recurved and heavily plumose; the terminal portion of palpus distinctly one-jointed; one large spine at base of palpus. Second leg with basal joint shorter than second, the fourth but little longer than third.

Subclass CLADOCERA

Chydorus simplex n. sp.

(Figure 64)

With *Diaptomus stagnalis* and *Cyprinotus californicus*, Mr. Hall took numbers of an exceedingly minute (length .4-.5 mm.) *Chydorus*. The anterior projection of the shell is long, very slender, and very sharp, and is frequently more closely incurved to the anterior margin of the shell than in the specimen drawn. The shell has a depth about three times the hind margin. The distal (lower) margin is edged with minute short plumed hairs to a point in front of the legs where the curve to the anterior angle begins, and from that point to the anterior angle they are replaced by small teeth. The postabdomen is long subrectangular, the terminal claws shorter than its greatest width and these claws provided with a rather strong lateral tooth behind. Lower hind border of postabdomen with a number of small tufts of short hairs which are longer distally. Two long spines occur above the anal opening. Posterior intestinal cœcum long and slender.