A NEW SPECIES OF AMPHIPOD CRUSTACEAN (ACANTHONOTOZOMATIDAE) FROM CALIFORNIA, AND NOTES ON EURYSTHEUS TENUICORNIS

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In the course of a study of some amphipods recently sent to the United States National Museum for identification by the Pacific Biological Laboratories, of Pacific Grove, Calif., two specimens were noticed which represent a new species. This I have named *Panoploea rickettsi* for E. F. Ricketts, director of the Pacific Biological Laboratories. The genus *Panoploea* is now recorded for the first time from the west coast of America.

Eurystheus tenuicornis was described by Prof. S. J. Holmes in 1904 from a single specimen taken in Puget Sound, but has not been recorded by anyone since then. A number of specimens belonging to the genus *Eurystheus* were noted among some amphipod material received from several localities in southern California. Upon detailed examination, I concluded that these specimens belonged with Holmes's species *Eurystheus tenuicornis*, though the old and very mature males exhibited some characters which were not possessed by his specimen. These characters will be discussed under *Eurystheus tenuicornis* (Holmes) in the body of this paper.

PANOPLOEA RICKETTSI, new species

Figures 1–2

Description.—Head, rostrum very long and narrow, front margin with very shallow angle just below the eye, lower front corner bearing two sharply pointed processes. Eye rather large, reniform, colorless in the alcoholic specimens. Antenna 1 a little longer than 2, first joint twice as wide and long as second, which is one-third longer than the third, flagellum nearly twice as long as peduncle and composed of about 13 joints. Antenna 2, fifth joint longer than fourth, flagellum a little longer than peduncle and composed of about 20 joints. Mouth parts all elongate and projecting prominently below

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23910—31

the side-plates. Upper lip about as broad as long, converging toward the rounding and slightly emarginate apex. Mandible very long and slender, but widening abruptly at the base, apex slightly curved, pointed and bearing a few low teeth on lateral margin, accessory plate originating about half way between molar and apex, very long and slender, and surmounted by a single setule, molar situated about one-third the distance from the base and not very strong, palp situated back of the molar very near the base, and when extended reaching very little beyond the apex of the mandible. Maxilla 1, inner plate bearing four plumose setae, outer plate very long and narrow, and bearing 10 serrate spine-teeth on the very oblique upper margin, palp slender, second joint about one-third longer than first and bearing four or five slender spines on apex. Maxilla 2, inner plate shorter and broader than outer, the very oblique extremity bearing many plumose spines, and the outer plate bearing many long curved distal spines. Maxillipeds, inner and outer plates long and slender, outer plates becoming narrower toward the apex, palp with first joint set at right angle to the plates, and the second and third joints parallel with them, second joint with inner margin produced distally into a broad lobe, second and third joints armed distally with many long spines. Lower lip, outer lobes incised on inner margins near apex, inner lobes wanting, lateral processes long and prominent. Side-plate 1 more rounding distally than 2 or 3, and side-plates 1 to 4 each bearing a few serrations on inner margin near apex. Gnathopods 1 and 2 chelate. Gnathopod 1 very slender and a little longer than 2, fifth joint slightly longer than sixth, seventh joint closing against and exactly fitting palm, end of sixth and seventh joints slightly unguiform. Gnathopod 2 slender but stouter than 1, fifth joint very slightly shorter than sixth, seventh joint closing against and exactly fitting palm which is armed throughout with a row of forward pointing bristles. Side-plates 5 to 7 produced posteriorly to a sharp point. Peraeopods 3 to 5 rather robust and increasing slightly in length consecutively. Peraeopod 3, second joint with lower posterior corner broadly rounding, and upper posterior corner produced to a sharp point, fourth joint with lower posterior corner produced to about the middle of fifth joint. Peraeopod 4, second joint with lower posterior corner produced to a sharp point, and upper posterior corner but slightly produced, rest of limb as in peraeopod 3. Peraeopod 5, second joint with lower posterior corner produced to a sharp point and upper posterior corner broadly rounding, rest of limb as in peraeopods 3 and 4. Peraeon segment 7 and pleon segments 1 to 3 each produced dorsally into two backward projecting teeth. The lower posterior corner of peraeon segment 7 and the upper lateral corner of pleon segments 1 and 2 produced to sharp points. Pleon segment 3 with the upper and lower lateral

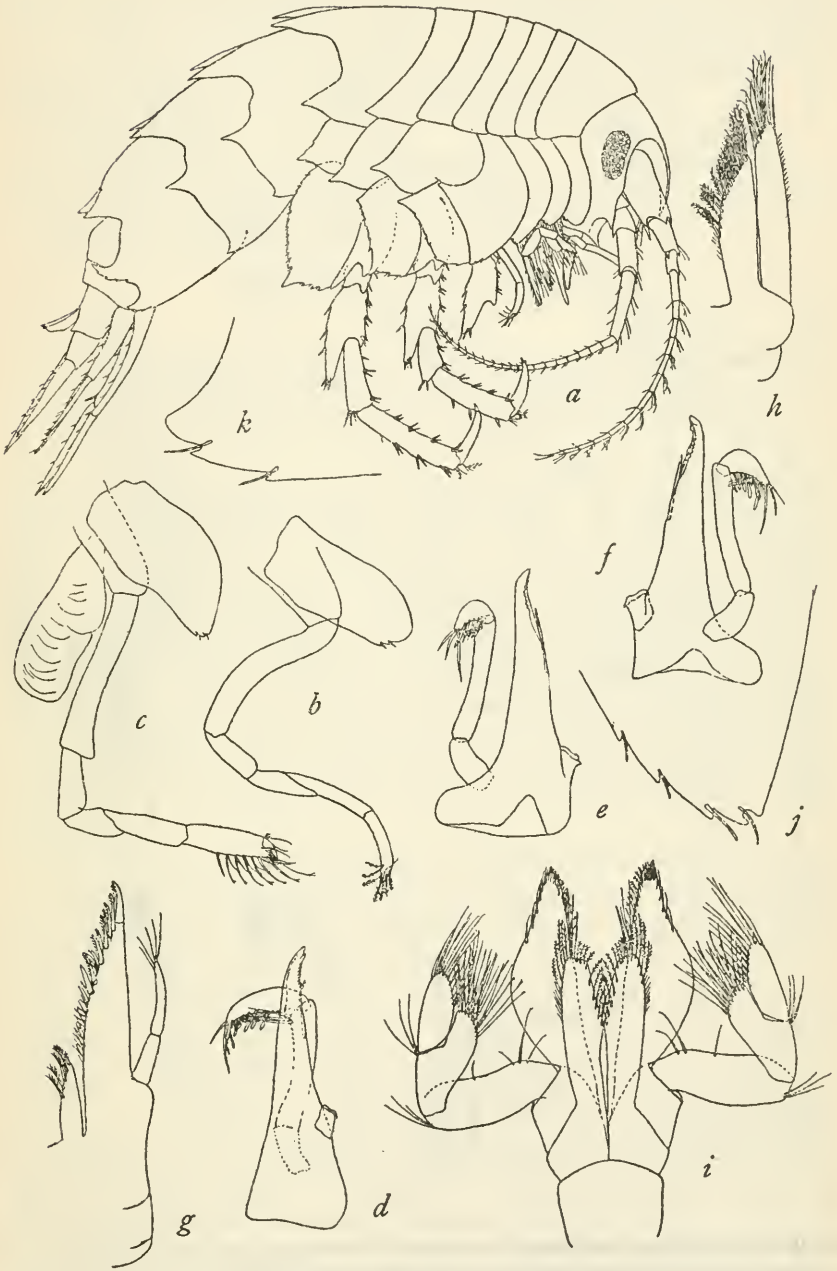

FIGURE 1.—PANOPLOEA RICKETTSI, NEW SPECIES: *a*, ENTIRE ANIMAL; *b*, GNATHOPOD 1; *c*, GNATHOPOD 2; *d–f*, MANDIBLE; *g*, MAXILLA 1; *h*, MAXILLA 2; *i*, MAXILLIPEDS; *j*, SIDE-PLATE 1; *k*, SIDE-PLATE 2

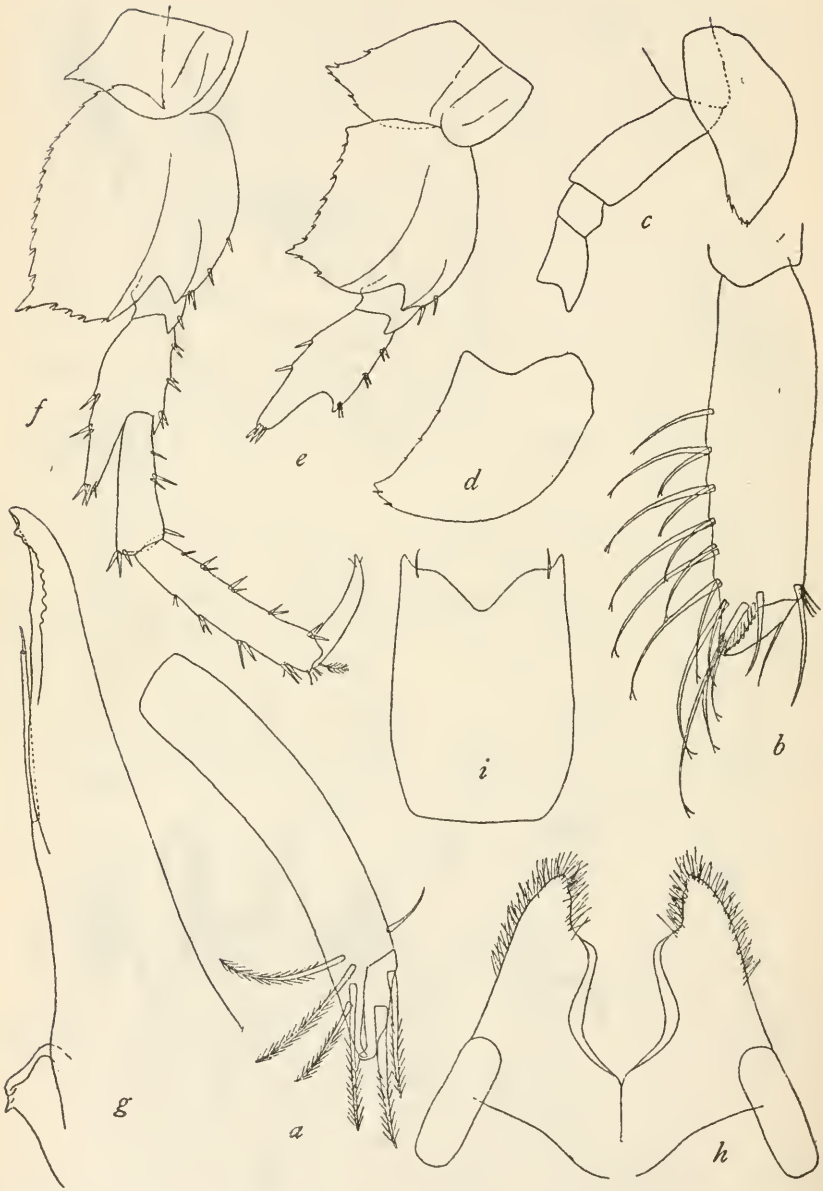

FIGURE 2.—PANOPLOEA RICKETTSI, NEW SPECIES: *a*, GNATHOPOD 1, ENLARGED; *b*, GNATHOPOD 2, ENLARGED; *c*, SIDE-PLATE 3; *d*, SIDE-PLATE 4; *e*, PERAEOPOD 4; *f*, PERAEOPOD 5; *g*, MANDIBLE, ENLARGED; *h*, LOWER LIP, ENLARGED; *i*, TELSON

corners produced into prominent up-turned processes which are serrate on their lower margins. Uropod 1 extending farther back than 2 or 3, which are subequal in length. Outer ramus of all uropods the shorter. Telson a little longer than wide, slightly excavate, and having the lateral corners somewhat produced.

Length.—4.5 mm.

Type.—Cat. No. 63281 U.S.N.M., off Moss Landing, Pacific Grove, Monterey Bay, Calif., taken from rock from 50+ fathoms, collected by the Pacific Biological Laboratories, No. 78.1.

EURYSTHEUS TENUICORNIS (Holmes)

Figures 3–4

1904 *Gammaropsis tenuicornis* HOLMES, Harriman Alaska Expedition: Amphipod Crustaceans of the Expedition, p. 239, fig. 124.

1916 *Podoceropsis concava* SHOEMAKER, Proc. Biol. Soc. Washington, vol. 29, p. 159.

This species was described by Prof. S. J. Holmes from a single immature male specimen from Puget Sound. In 1916 I described a species, *Podoceropsis concava*, from Venice, Southern California. These specimens also were immature, and lacked the antennae. Recently while studying collections from various California localities, containing specimens in all stages of development, I found that old individuals differed greatly from the younger ones in certain characters, and that some individuals exhibited the characters of *Eurystheus tenuicornis* (Holmes), while others possessed those of *Podoceropsis concaca* Shoemaker. There can be no doubt, therefore, that *E. tenuicornis* and *P. concava* are but variations of the same species.

In the younger males the palm of gnathopod 2 is defined by two low teeth, and the sixth joint is very much longer than the fifth. In males of more advanced growth the palm is defined by a single low tooth, and the sixth joint is very little longer than the fifth. In the oldest males the defining tooth of the palm is much more strongly developed, and the central tooth is distinct from the palm and not a mere triangular projection as in younger specimens, while the sixth joint is considerably shorter than the fifth. Gnathopod 2 of the female with palm evenly convex, without defining angle, but possessing two defining spines and having the sixth joint very slightly longer than the fifth. The side-plate of peraeopod 5 in the younger males is of normal proportions, but increases very markedly in size with advancing age until in the old males it attains enormous development and completely covers the second joint of the peraeopod. Pleon segments 2 and 3 with lateral margins strongly convex, and postero-lateral corners indicated by a shallow angle. Pleon segment 4 bears dorsally a backward-pointing tooth and seta on either

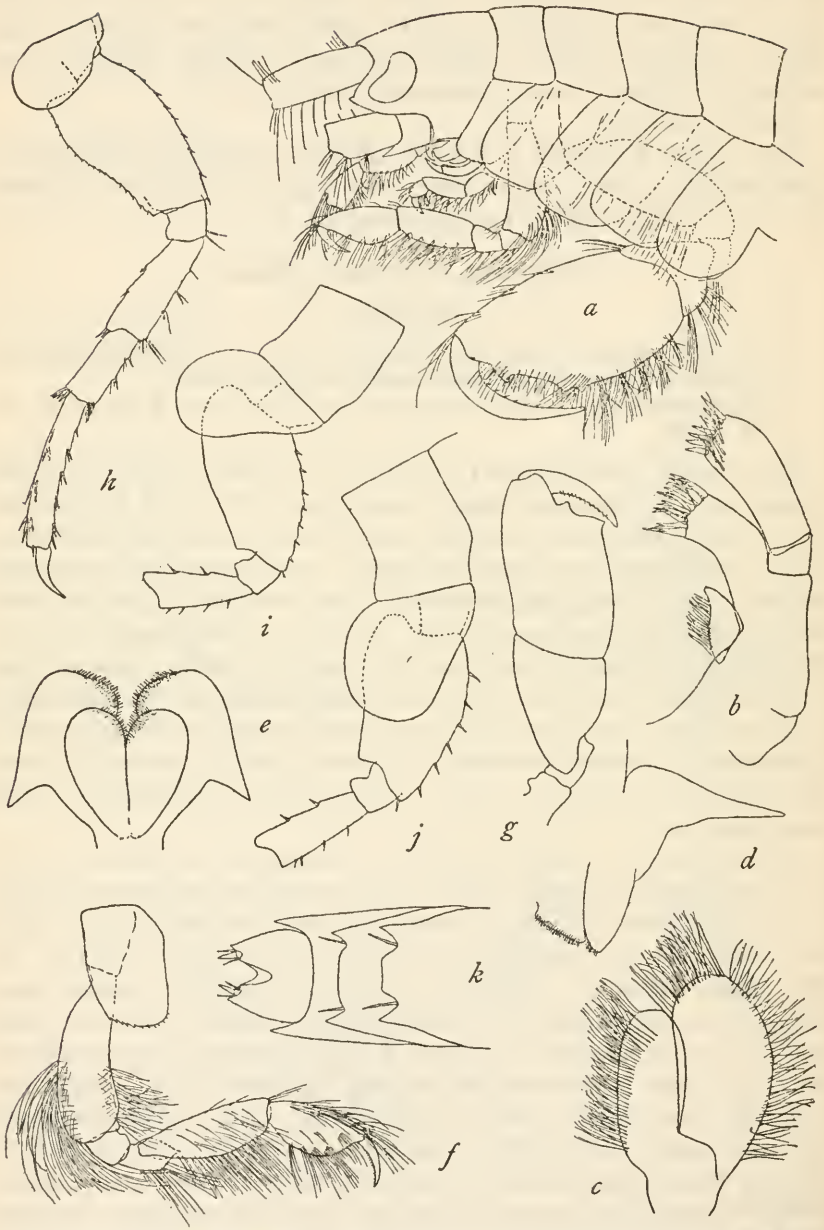

FIGURE 3.—EURYSTHEUS TENUICORNIS (HOLMES): *a*, ANTERIOR HALF OF YOUNG MALE: *b*, MAXILLA 1; *c*, MAXILLA 2; *d*, UPPER LIP; *e*, LOWER LIP; *f*, GNATHOPOD 1, MALE; *g*, GNATHOPOD 2, MALE OF INTERMEDIATE DEVELOPMENT; *h*, PERAEOPOD 5, FEMALE; *i–j*, PERAEOPOD 5 OF MALES SHOWING INTERMEDIATE STAGES OF DEVELOPMENT OF SIDE-PLATE; *k*, DORSAL VIEW OF FOURTH, FIFTH, AND SIXTH PLEON SEGMENTS AND TELSON

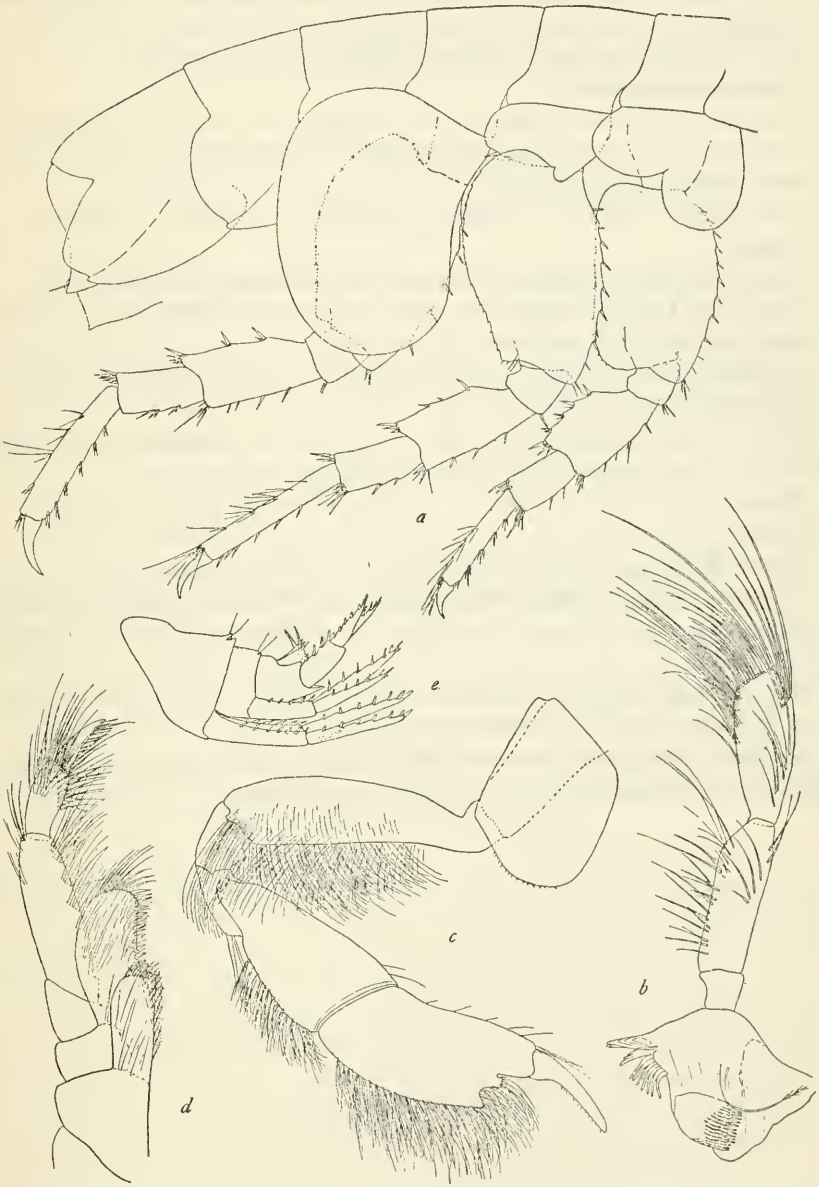

FIGURE 4.—EURYSTHEUS TENUICORNIS (HOLMES): *a*, POSTERIOR HALF OF MALE SHOWING THE GREATEST DEVELOPMENT OF THE SEVENTH SIDE-PLATE; *b*, MANDIBLE; *c*, GNATHOPOD 2 OF FULLY DEVELOPED MALE; *d*, MAXILLIPED; *e*, FOURTH, FIFTH, AND SIXTH PLEON SEGMENTS, TELSON, AND UROPODS OF YOUNG MALE

side of a broad truncate lobe. Pleon segment 5 is armed dorsally as 4 but the lobe between the teeth is low and convex. The epistome is produced far forward into a sharply pointed cone.

The largest specimens measure about 11 mm. in length.

Material examined.—

Gulf of California, *Albatross* station 3024, March 25, 1889, latitude 31° 21′ 00″ N., longitude 113° 49′ 00″ W., 11 fathoms, large beam trawl; about 60 specimens.

San Diego, Calif., 10 fathoms, collected by Henry Hemphill; 8 specimens.

La Jolla, Calif., collected by Scripps Institution; 5 specimens.

La Jolla, Calif., August 28, 1918, collected by Waldo L. Schmitt from kelp hold-fast on beach; 8 specimens.

Laguna Beach, Calif., received from the Laguna Beach Marine Laboratory; 1 specimen.

Venice, Calif., collected by the Venice Marine Laboratory, mostly from the breakwater, 1912 and 1913; 25 specimens.

Santa Monica, Calif., June 16, 1918, collected by E. P. Chase; 1 specimen.

Santa Monica, Calif., collected by F. C. Clark; about 60 specimens.

Monterey Bay, Calif., collected by the Pacific Biological Laboratories, on rocks brought up from 100+ fathoms, March 7, 1928; 1 specimen.

San Francisco Bay, *Albatross* station 5775–*a* off Point Cavallo, 7–4 fathoms, April 16, 1912; 1 specimen.

Golden Gate, San Francisco Bay, Calif., *Albatross* station 5809, 53–21½ fathoms, November 4, 1912; 4 specimens.