

CALANOID COPEPODS OF THE GENUS *AETIDEUS* FROM THE GULF OF MEXICO¹

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ABSTRACT

The copepod population known previously as belonging to *Actideus armatus* (Boeck) in the Gulf of Mexico and Caribbean Sea is recognized as a separate species. The males of *Actideus acutus* Farran and *Actideus giesbrechti* Cleve are fully redescribed with figures.

The genus *Actideus* Brady, 1883, comprised four species (*A. armatus*, *A. bradyi*, *A. acutus*, and *A. giesbrechti*) when Sars (1925) established the genus *Euaetideus* to distinguish the last three species from the first. A new species has since been added to each genus, *A. pacificus* and *E. australis*. Bradford (1971) reviewed the genera *Actideus* and *Euaetideus* on the basis of specimens from the Atlantic and Pacific Oceans. Having found a close similarity between the males, she proposed the merging of the two genera. In agreement with her proposal, the name *Euaetideus* is considered here as a junior synonym of *Actideus*.

In the Gulf of Mexico, three species of *Actideus* (*A. armatus*, *A. acutus*, and *A. giesbrechti*) have been recorded (Owre and Foyo, 1967; Park, 1970). During the examination of plankton samples obtained from the Gulf of Mexico by the RV *Alaminos* in September 1971, all of these species were found, including the males.

A. armatus had been known to have worldwide distribution (Vervoort, 1957) until Bradford (1971) recognized a population in the Southern Hemisphere and two in the North Pacific as separate species. Bradford also noted differences between the northern and southern forms of *A. armatus* in the Atlantic, but the differences were not considered as taxonomically significant. When examined in detail in the light of Bradford's findings, the Gulf of Mexico population of *A. armatus*, however, was found to be significantly different from either the northern or southern Atlantic form of the spe-

cies, or from any other known species of the genus. Therefore, it is described here as a new species.

A. acutus and *A. giesbrechti* found in this study were in agreement with the descriptions by Grice (1962) and Park (1968) for the Pacific forms. The males of these species have not been fully described, except for brief descriptions by Giesbrecht (1892) and Bradford (1971).

AETIDEUS MEXICANUS, NEW SPECIES

Type.—Holotype female, U.S. National Museum No. 143777; allotype male USNM No. 143778; 30 female and 7 male paratypes, USNM No. 143779. Type locality, lat. 25° 15' N, long. 89° 11' W, in the Gulf of Mexico (sampling depth, about 500-0 m).

Female.—Body lengths of 31 type specimens, 1.66-1.84 mm. Proportional lengths of prosome and urosome about 78:22. Viewed dorsally, body slender, with a round, slightly produced forehead (Figure 1A). Laterally, dorsal margin of forehead broadly vaulted at level of mouth (Figures 1B, D). Two rostral rami separated by a U-shaped notch (Figure 1G). Distance between tips of rostral rami exceeding depth of notch (1.07-1.15:1). Metasomal process extending straight backward; although variable in length, generally reaching about distal end of genital segment. Dorsally, genital segment (Figure 1H) wider than long, with its widest part close to its proximal end. Shape of spermatheca (Figures 1C, F) similar to *A. armatus* as described by Bradford (1971), with short wide neck connecting proximal and distal sacs; space between two sacs slightly

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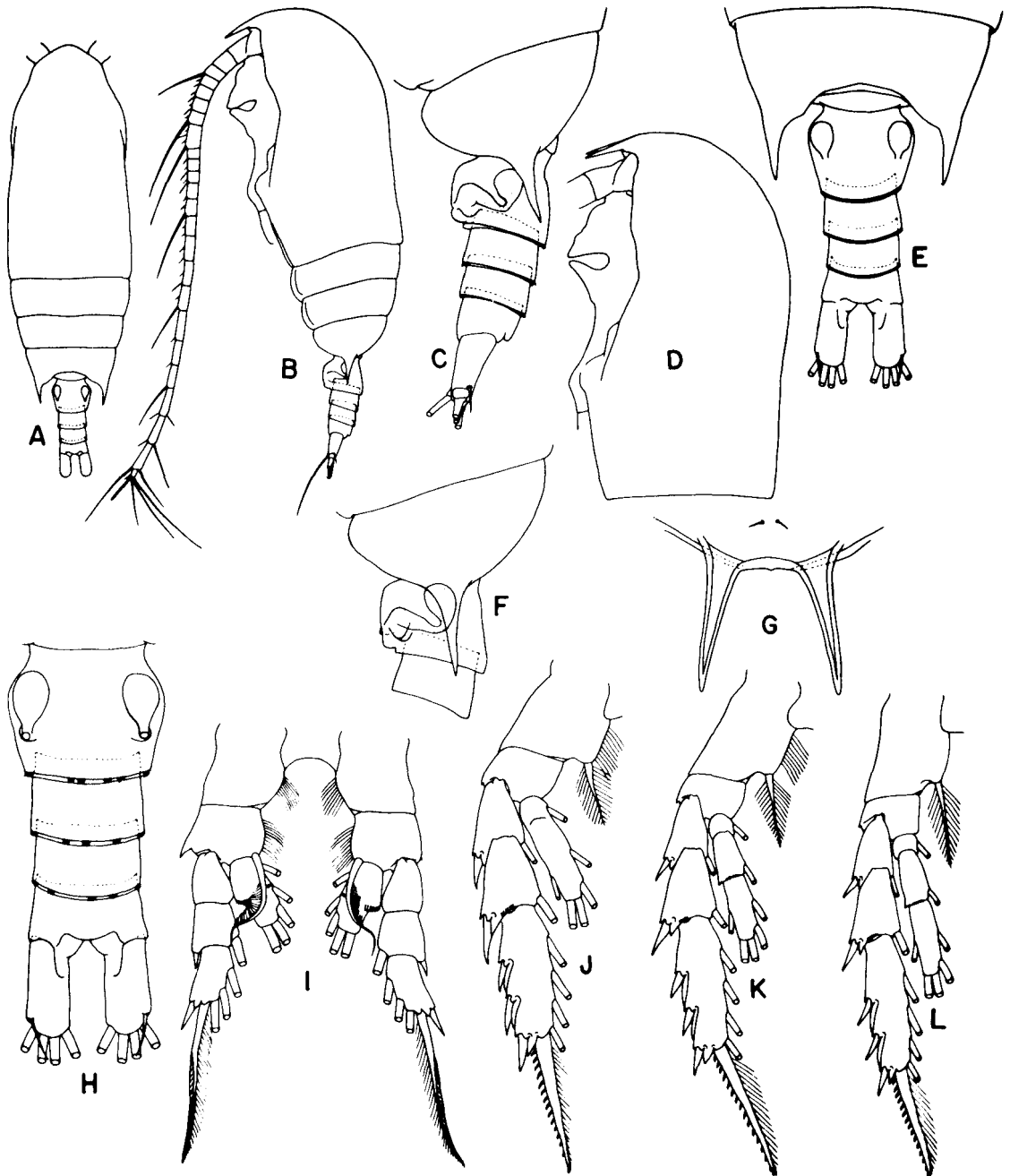


FIGURE 1.—*Actideus mexicanus*, new species. Female: A, habitus, dorsal; B, habitus, lateral; C, posterior part of body, lateral; D, forehead, lateral; E, posterior part of body, dorsal; F, last metasomal and first two urosomal segments of another specimen, lateral; G, rostrum, anterior; H, urosome, dorsal; I, first pair of legs, anterior; J, second leg, anterior; K, third leg, anterior; L, fourth leg, anterior.

wider than connecting neck. Caudal ramus about 2.4 times as long as wide.

Antennules extending beyond distal end of caudal ramus by last two segments. Other

cephalic appendages as in *A. pacificus* as described by Park (1968). In most of the specimens dissected the first pair of legs were asymmetrical, with the external margin of the right

basis produced distally into a large tooth-like process (Figure 1I). Second to fourth legs (Figures 1J-L) similar to *A. pacificus*, but coxa of fourth leg without spinules at base of internal seta. Terminal exopodal spines of second to fourth legs with 15-17 teeth.

Male.—Body lengths of eight type specimens, 1.58-1.68 mm. Proportional lengths of prosome and urosome about 75:25. Body slender, with forehead slightly produced (Figure 2A). Rostrum reduced. Metasomal process pointing straight backward, reaching about distal end of genital segment (Figures 2D, E). Second to fourth urosomal segments and caudal rami (Figure 2E) with width:length ratios of 1:0.98-1.05, 1:1.08-1.15, 1:1.12-1.19, and 1:1.82-2.00, respectively. Antennules reaching about distal end of fourth urosomal segment, nineteenth and longest segment (Figure 2G) with width:length ratio of 1:4.9-5.1. On second leg (Figure 2M), endopod reaching distal end of second exopodal segment. On second and third legs (Figure 2N), terminal exopodal spines longer than third exopodal segments, with about 29 and 23 teeth, respectively. Second to fourth segments of fifth leg (Figure 2O) with width:length ratios of 1:3.7-4.2, 1:8.3-8.7, and 1:9.0-9.7, respectively.

Remarks.—The female of *A. mexicanus* is distinguished from *A. armatus* by the slender body, long antennules which extend beyond the caudal rami by two segments and, particularly, the fourth leg which lacks spinules at the base of the coxal seta found in all other species of the genus (Bradford, 1971). The male of *A. mexicanus* is very close to that of *A. armatus* as described by Bradford but seems to differ from it in the proportions of the caudal rami and of the second to fourth segments of the fifth legs. However, the importance of these characters in the distinction between the two species is yet to be determined.

Distribution.—*A. mexicanus* was found in a number of plankton samples taken from the upper 500 m in the Gulf of Mexico by the RV *Alaminos* in September 1971. *A. armatus* recorded from the Caribbean Sea by Park (1970) belongs to this new species.

AETIDEUS ACUTUS FARRAN, 1929

Male.—Body length, 1.22-1.36 mm according to 48 randomly selected specimens. Proportional lengths of prosome and urosome about 79:21. Dorsally, forehead (Figure 3B) more produced than in *A. mexicanus*. Rostrum reduced. Metasomal process with wide base, distinctly curved downward when viewed laterally (Figure 3E) and slightly curved inward in dorsal view (Figure 3D). Second to fourth urosomal segments and caudal rami with width:length ratios of 1:0.83-0.88, 1:0.75-0.81, 1:0.78-0.81, and 1:1.64-1.83, respectively.

Antennules reaching about distal end of third urosomal segment, nineteenth and longest segment (Figure 3F) with width:length ratio of 1:3.31-3.52. Other cephalic appendages similar to *A. mexicanus*. On second leg (Figure 3L), endopod reaching distal end of second exopodal segment. Terminal exopodal spines of second and third legs (Figure 3M) longer than their third exopodal segments, with about 23 and 18 teeth, respectively. Terminal exopodal spines of fourth legs (Figure 3N) shorter than their third exopodal segments, with about 16 teeth. Second to fourth segments of fifth leg (Figure 3O) with width:length ratios of 1:3.41-3.78, 1:6.72-7.33, and 1:6.00-6.60, respectively.

Remarks.—The male of *A. acutus* was first described very briefly by Bradford (1971). The present specimens seem to be in agreement with her descriptions. The male of *A. acutus* is easily distinguished from those of *A. mexicanus* and *A. giesbrechti* by its considerably smaller size. In the shape of the forehead, metasomal process, and antennule, it is closely related to *A. giesbrechti*, but differs from this species in the relative lengths of the urosomal segments and caudal rami.

The female specimens of *A. acutus* in the present study (1.48-1.62 mm in body length according to 80 randomly selected specimens) are identical with the specimens described by Park (1968) from the Pacific, and can be readily recognized by the shape of the spermatheca (Figure 3A). The appendages are similar to those of *A. pacificus* as described by Park (1968), except that the maxillule carries 3+3+6 setae on the endopod.

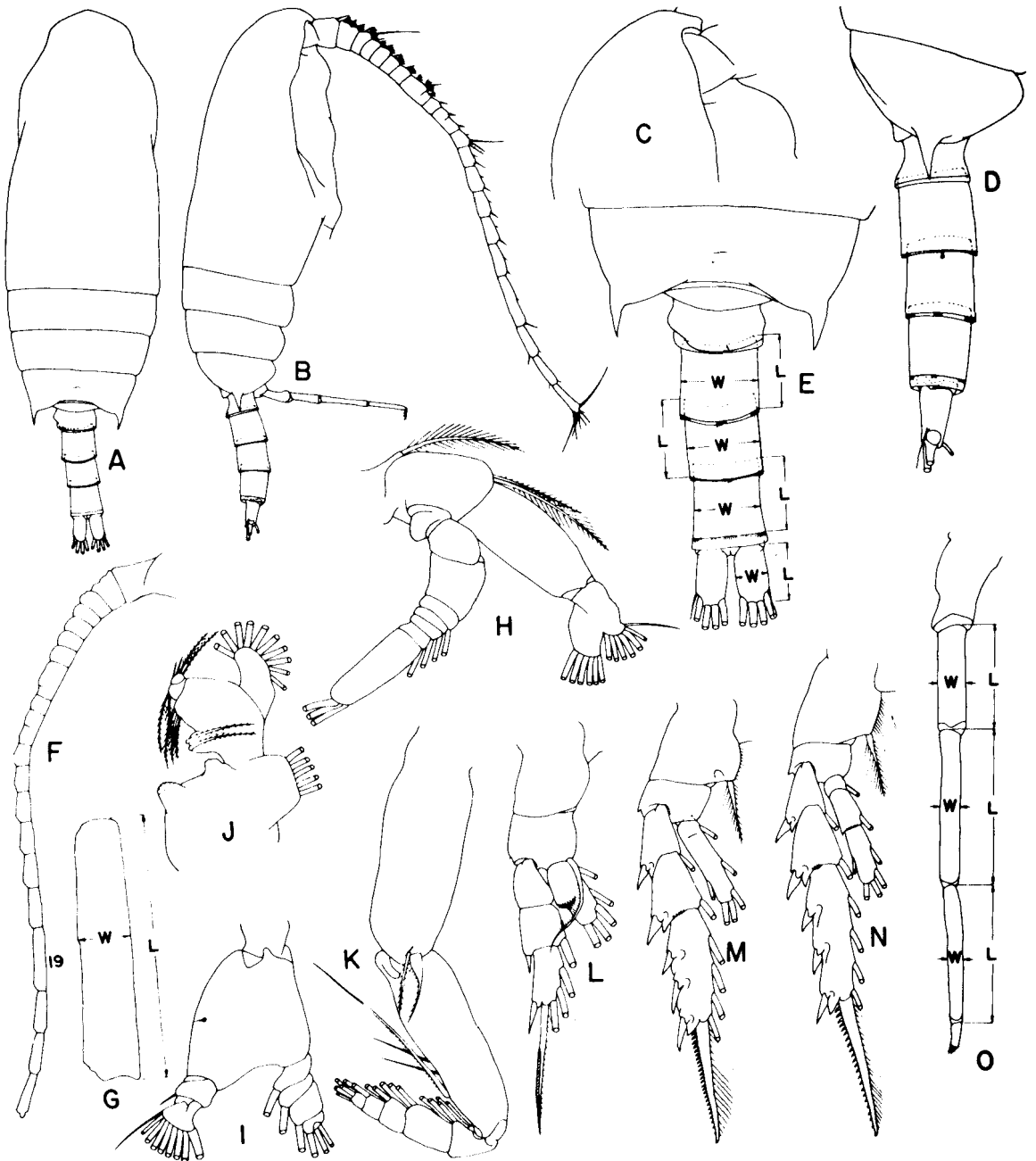


FIGURE 2.—*Actideus mexicanus*, new species. Male: A, habitus, dorsal; B, habitus, lateral; C, forehead, lateral; D, posterior part of body, lateral; E, posterior part of body, dorsal; F, antennule, setae omitted; G, 19th segment of antennule; H, antenna; I, mandible; J, maxillule; K, maxilliped; L, first leg, anterior; M, second leg, anterior; N, third leg, anterior; O, fifth leg, anterior. (L and W, length and width of segment.)

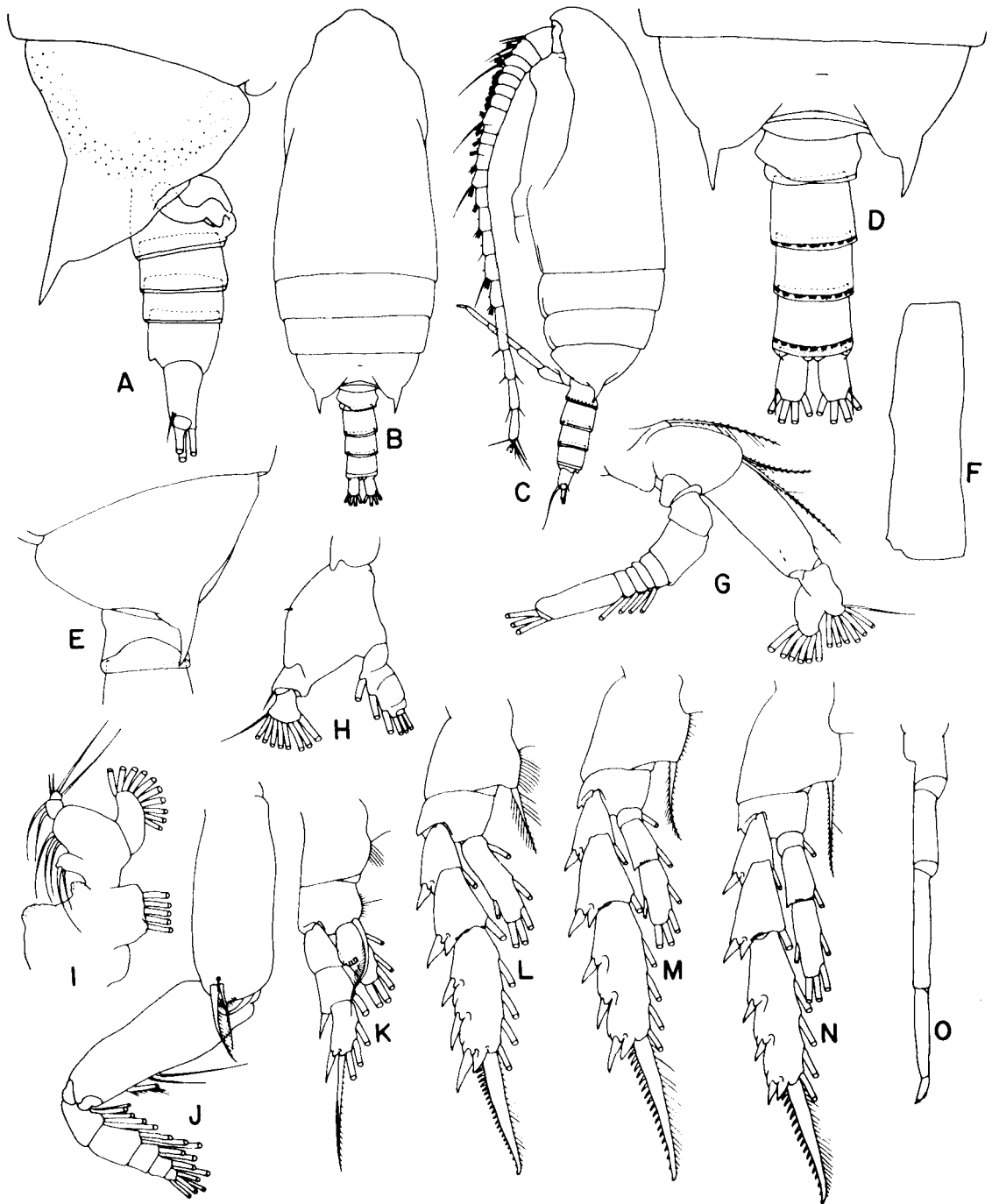


FIGURE 3.—*Actideus acutus*. Female: A, posterior part of body, lateral. Male: B, habitus, dorsal; C, habitus, lateral; D, posterior part of body, dorsal; E, last metasomal and genital segments, lateral; F, 19th segment of antennule; G, antenna; H, mandible; I, maxillule; J, maxilliped; K, first leg, anterior; L, second leg, anterior; M, third leg, anterior; N, fourth leg, anterior; O, fifth leg, anterior.

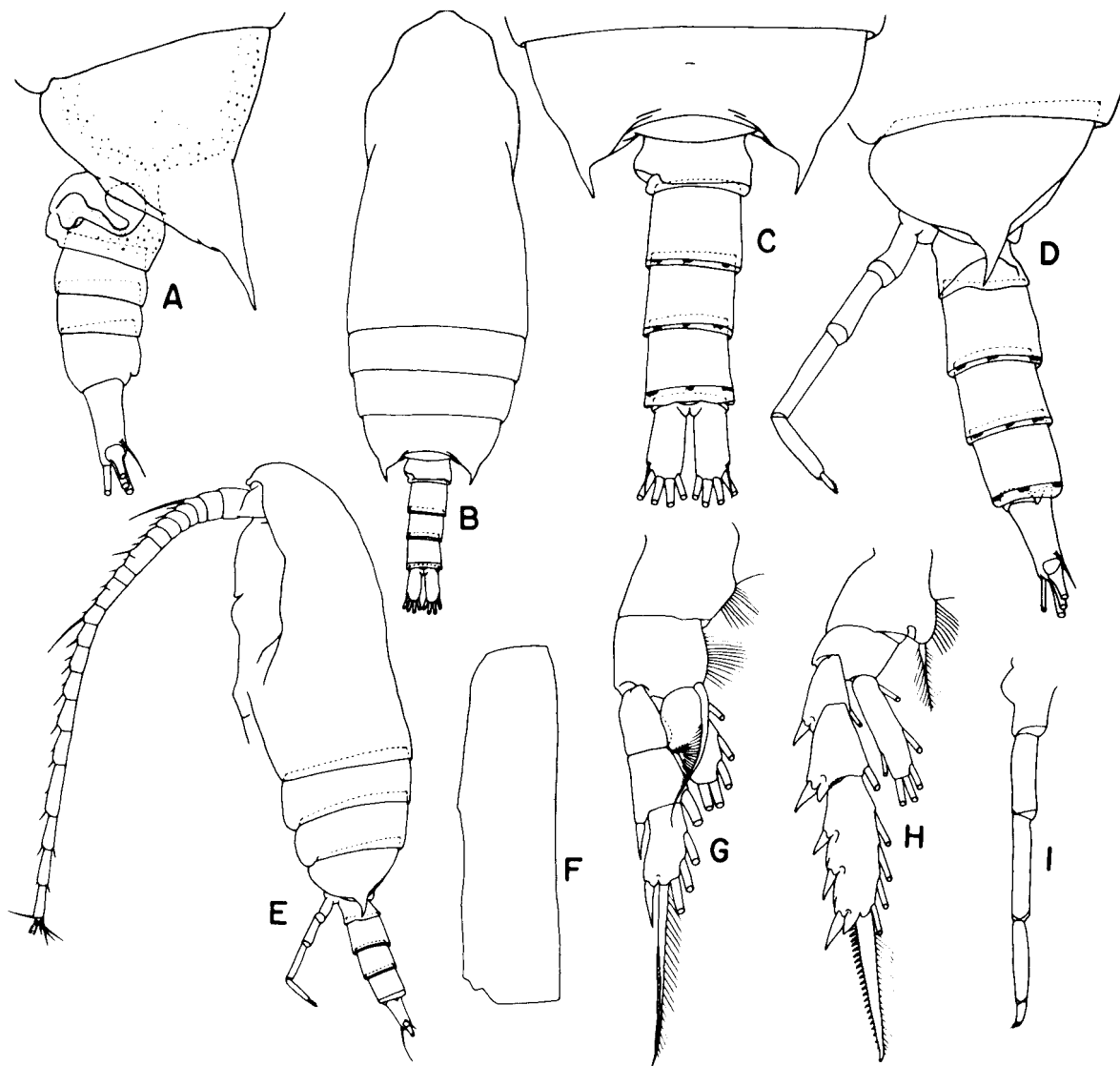


FIGURE 4.—*Actideus giesbrechti*. Female: A, posterior part of body, lateral. Male: B, habitus, dorsal; C, posterior part of body, dorsal; D, posterior part of body, lateral; E, habitus, lateral; F, 19th segment of antennule; G, first leg, anterior; H, second leg, anterior; I, fifth leg, anterior.

Distribution.—*A. acutus* was originally described from off New Zealand (Farran, 1929). The species has so far been known to occur on the Great Barrier Reef (Farran, 1936), in the Malay Archipelago (Vervoort, 1957), off the Pacific coast of Middle Japan (Tanaka, 1957; Tanaka and Omori, 1970), in the tropical Pacific (Grice, 1962), the northwestern Pacific (Brodsky, 1962), the central North Pacific (Park, 1968), the northeast Atlantic (Grice and Hulsemann, 1965), the Caribbean Sea and

Gulf of Mexico (Park, 1970), and in the western Indian Ocean (De Decker and Mombeck, 1965; Grice and Hulsemann, 1967). In the Gulf of Mexico, *A. acutus* is the most common of all three *Actideus* species so far known to occur, and it is mainly found in the upper 500 m.

AETIDEUS GIESBRECHTI CLEVE, 1904

Male.—Body length, 1.52-1.60 mm according to 50 randomly selected specimens. Propor-

tional lengths of prosome and urosome about 77:23. Dorsally, forehead (Figure 4B) produced as in *A. acutus*. Rostrum reduced. Metasomal process (Figures 4C, D) as in *A. acutus*. Second to fourth urosomal segments and caudal rami with width:length ratios of 1:0.93-0.95, 1:0.85-0.86, 1:0.88-0.89, and 1:2.27-2.38, respectively.

Antennules reaching about distal end of third urosomal segment, nineteenth and longest segment (Figure 4F) with width:length ratio of 1:3.75-3.86. Other cephalic appendages as in *A. acutus*. On second leg (Figure 4H), endopod extending beyond distal end of second exopodal segment. Terminal exopodal spine longer than third exopodal segment, with about 24 teeth. Second to fourth segments of fifth leg (Figure 4I) with width:length ratios of 1:3.34-4.00, 1:6.00-6.25, and 1:5.00-6.65, respectively.

Remarks.—The male of *A. giesbrechti* is close to *A. mexicanus* in size but can be distinguished from it by the more produced forehead, wide and curved metasomal process, relatively short urosomal segments, wide nineteenth segment of the antennule, and long endopod of the second leg.

A. giesbrechti, including the male, was first described with figures by Giesbrecht (1892) under the name of *A. armatus*. Although the female has been reported by many authors, the male has since been found only by Bradford (1971). The female specimens found in the present study (1.84-2.08 mm in body length according to 76 randomly selected specimens) are in agreement with the descriptions given by Grice (1962) for the Pacific specimens. The appendages are identical with those of *A. acutus*, but the females of the two species are different in the form of spermatheca (Figure 4A).

Distribution.—As reviewed by Vervoort (1957), *A. giesbrechti* has been found throughout the world's oceans, except for the high latitudes. In the Gulf of Mexico the species is quite common in the upper 500 m.

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