

THE SKELETON SHRIMPS (CRUSTACEA: CAPRELLIDAE)
OF THE GULF OF MEXICO¹

JOAN E. STEINBERG,

Department of Zoology,
University of California, Berkeley
and

ELLSWORTH C. DOUGHERTY,

Department of Physiology, School of Medicine,
University of California, Berkeley

To our knowledge, the only published records of skeleton shrimps, or caprellids—amphipods of the suborder Caprellina (or Caprellidea)—from the Gulf of Mexico are: 1) in a paper by Pearse (1908), in which he described as new *Protellopsis stebbingii* (= [better] *stebbingi*) on the basis of specimens collected in the Gulf off Key West, Florida ($24^{\circ}44'50''$ N; $81^{\circ}55'50''$ W);² 2) in a second paper by Pearse (1913), in which he listed *Caprella geometrica* Say, 1818, from this same locality, as well as *P. stebbingi* and a female of a *Caprella* sp. collected together at 25-27 fathoms between the delta of the Mississippi ($29^{\circ}0-20'$ N; $89^{\circ}0-40'$ W) and Cedar Keys, Florida ($29^{\circ}10'$ N; $83^{\circ}2'$ W); 3) in a pamphlet by Reed (1941: 43), who mentioned "*Caprella acutifrons*" as occurring on "elk's hair alga" found on rocks—near jetties, for example; 4) in a paper by Whitten, Rosene, and Hedgpeth (1950: 59, 61) and in an appendix to this paper by Hedgpeth (1950: 77-78), in both of which an unidentified "green" *Caprella* sp. and what was identified as "probably *Caprella acutifrons*" Latreille, 1816, were reported from jetties along the Texas coast; and 5) in a drawing by Hedgpeth (1953, fig. 46) of the faunal association of a sargassum bladder.

As regards the species reported in the first two of the foregoing papers, we believe that *Protellopsis stebbingi* is in reality *Deutella incerta* (Mayer, 1903) comb. nov., the status of which is treated later in this paper (*viz.*, in the discussion under *Deutella californica* Mayer, 1890) and that *C. geometrica* should properly be known as *Caprella carolinensis* Mayer, 1890, grad. nov.;³ it has not been possible to identify Pearse's "*Caprella* sp.". As regards the third paper we assume that, by "*Caprella acutifrons*", *C. carolinensis* was meant, for we have so identified the "*Caprella acutifrons*" of the fourth paper; we also believe that the "*Caprella* sp." of the latter paper was most probably *Paracaprella pusilla* Mayer, 1890, which we have ourselves identified

¹ Contribution No. 8 from the Laboratory of Comparative Physiology and Morphology of the Kaiser Foundation.

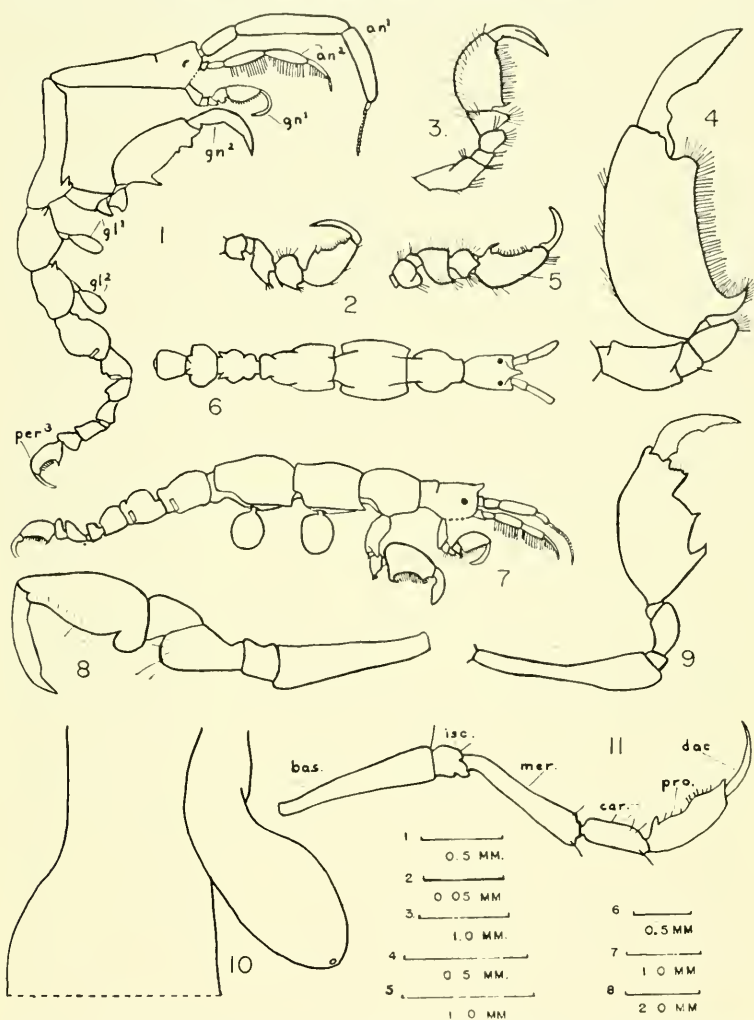
² For those latitude and longitude figures, given in this paper, that apply to specimens now in, or on loan from, the U. S. National Museum, Washington, D. C., we are indebted to Dr. Thomas E. Bowman, Associate Curator in charge of lower Crustacea, Division of Marine Invertebrates.

³ Grad. nov. = *gradus novus*; = new rank.

from specimens submitted to us as occurring together with *C. carolinensis* on the fishing pier at Port Aransas. The small caprellid figured in the fifth paper is not identifiable with certainty, but apparently represents *Hemiaegina minuta* Mayer, 1890. Therefore, there have been records, so far published, of at least four, probably five, caprellids from the Gulf of Mexico.

Some years ago Dr. Joel W. Hedgpeth (now of the Pacific Marine Station, Dillon Beach, California) kindly made available to one of us (E.C.D.) a small collection of skeleton shrimps from Port Aransas (27°50' N; 97°3' W) and Port Isabel (26°4' N; 97°12' W) on the Texas coast. Already at hand at that time were two vials included in a collection on loan from the U.S. National Museum by Dr. Waldo L. Schmitt and largely comprised of specimens from the Pacific coast of North America; the vials in question derived, however, from the Gulf and bore Albatross station numbers 2387 (29°24'0" N; 88°4'0" W) and 2389 (29°28'0" N; 87°6'0" W)—between the delta of the Mississippi and Cedar Keys, Florida. In addition, we have more recently received specimens collected: 1) in Alligator Harbor, Florida (29°54-55' N; 84°22-25' W), from Dr. Harold J. Humm (now of Duke University, Durham, North Carolina); 2) off Ship Island, Mississippi (30°14' N; 88°50' W), from Dr. Ellinor H. Behre (of the Louisiana State University, Baton Rouge); 3) from a fishing pier at Port Aransas, Texas 27°50' N; 97°3' W), from Dr. Henry Hildebrand (formerly of the Institute of Marine Science, University of Texas, Port Aransas); and 4) from two localities at Port Aransas, from C. E. Dawson (now of Bears Bluff Laboratories, Wadmalaw Island, South Carolina). We have also had specimens from other areas for comparative purposes—those already mentioned as loaned from the U.S. National Museum and others collected for us by Dr. Thomas E. Bowman (then of the Narragansett Marine Laboratory, University of Rhode Island, Kingston) in the vicinity of his laboratory. These collections have been studied and constitute the basis upon which the present paper has been written. We wish to express our appreciation to the foregoing workers for their generous assistance.

We have identified seven species in the material available to us, but, of these, only three (*C. carolinensis*, *H. minuta*, and *P. pusilla*) are among the four or five species already indicated as occurring in the Gulf of Mexico. It is possible that *Caprella* sp. of Pearse is also represented in our collection, but for the present there is no way of determining this point. We have not found *Deutella incerta*. [See Addendum.] Of the four species found by us, but not hitherto reported (either as such or under a name that we recognize as a synonym) from the Gulf, two have been described previously from other areas; one appears new to science, but is represented by inadequate material (a species of *Caprella*); and one is here described and named as new. There accordingly appear to be at least eight species of



Figures 1-11. Adult males, or appendages thereof. 1. *Caprella equilibra* (1st and 2nd pereopods missing): an¹—antennula; an²—antenna; gl¹, gl²—1st and 2nd gills; gn¹, gn²—1st and 2nd gnathopods; per³—3rd pereopod (7th pereod); 2. *C. equilibra*, 1st pereopod (i.e., of 5th pereod); 3. *C. carolinensis*, 1st gnathopod; 4. *C. carolinensis*, 2nd gnathopod; 5. *C. carolinensis*, 1st pereopod (i.e., of 5th pereod); 6. *C. carolinensis*, dorsal view; 7. *C. carolinensis*, lateral view (1st and 2nd pereopods missing); 8. *Hemiagrina minuta*, 1st gnathopod; 9. *H. minuta*, 2nd gnathopod; 10. *H. minuta*, vestigial appendage of 3rd pereod attached at top of 1st gill (cut at dotted line); 11. *H. minuta*, 1st complete pereopod (i.e., of 5th pereod): bas.—basis; isc.—ischium; mer.—merus; pro.—propodus. (Figs. 1, 6, and 7, scale 8; fig. 2, scale 7; figs. 3 and 4, scale 6; fig. 5, scale 3; fig. 8, scale 1; fig. 9, scale 5; fig. 10, scale 2; fig. 11, scale 4.)

Caprellidae now known in the Gulf of Mexico, and there can be little doubt that systematic collecting will reveal others.

CAPRELLA CAROLINENSIS MAYER, 1890, loc. nov.

(Figures 3-7)

Synonymy.—*Caprella acutifrons* var. *carolinensis* Mayer, 1890; *Caprella geometrica*, of Pearse, 1913 (*non* Say, 1818); *Caprella acutifrons*, of Whitten, Rosene, and Hedgpeth, 1950 (*non* Latreille, 1816).

Diagnosis.—*Caprella*: cephalon bearing a median, anteriorly directed spine; rest of body (figs. 6, 7) smooth except for a pair of spines located at posterior end of pereods⁴ 5 and 6; third and fourth pereods of equal length, with pleura rather well developed and somewhat thickened; fifth, sixth, and seventh pereods successively smaller and approximately as long as cephalon and second pereod combined; gills oval to round in outline.

Antennule (first antenna) about one-fourth length of body; flagellum slightly shorter than peduncle and composed of 12 segments. Antenna proper (second antenna) nearly as long as antennule and bearing natatory hairs on its inner surface.

First gnathopod small (fig. 3) palm of propodus straight and

⁴ The word *pereod* (then spelled "peraeod") was introduced by us (Dougherty and Steinberg, 1953) without our realizing that we were creating—so far as we can now determine—a new term. The meaning is implicit in our 1953 paper and later (Dougherty and Steinberg, 1954, p. 167) explicitly given as a "segment [of the *peraeon*]." It can be construed as derived from the Greek words *περαοῖν* (*to bring across*—thence the combining form *περαο-*) and *εἶδος* (*figure, thing*—contracted to the suffix—*οδης*, with its declensional ending dropped).

The familiar words *pereion* (or *peraeon*) and *pereiopod* (or *peraeopod*) are here rendered as *pereon* and *perepod*, along with *pereod*, in accordance with the general tendency in American English to reduce the classic diphthongs "æ" and "œ" of Latin (= *ai* and *oi* of Greek) to "e". It may be remarked that the spelling *pereion*, etc., are defective transcriptions, originating with Spence Bate (1856—who misused words of Greek origin in a number of curious ways); the Greek combining form *περαο-* should be Anglicized as *peraeo-* (British) or *pere-* (American), not as *perei-* or *pereio-*. (Spence Bate actually used the plural spelling *pereiopoda* [sic] and only later—1857—corrected it to *pereiopoda* [sic], the singular form *pereiopados* [!] being then employed by Spence Bate and Westwood—1861. Amusingly enough, in several places Spence Bate—e.g., 1859—used the singular form *pereiopod* along with the plural form *pereiopoda*. His usage was a hopeless mishmash of imperfectly Latinized Greek and vernacular English!) Smith (1880) appears to have been the first to correct Spence Bate's erroneous transcription, although without specifying that he was so doing. The spellings *pereon* and *pereopoda* (as respective Latin equivalents of the Russian *перион* and of *периопод*—sing., *периоподы*—pl.) have already been used by Gur'ianova (1951, p. 24).

By analogy with *pereod*, one can form *pleod* for individual segments of the *pleon*. These two forms (*pereod* and *pleod*) commend themselves to us as short and euphonious.

bearing a pair of spines at base (only one can be shown in view depicted in fig. 3) and hairs along entire edge; dactylus only slightly curved and minutely denticulate on inner surface with lateral surface also bearing a longitudinal line of denticulations distally. Second gnathopod⁵ (fig. 4) a little longer than cephalon and second pereod combined and attached to middle of segment in both sexes; first segment (basis⁶) slightly longer than second (ischium⁶) and third (merus) combined and bearing a single anterior ridge on outer edge—merus bearing a small tuft of hairs on posterodistal aspect; fourth segment (carpus) a narrow wedge-shaped connecting piece between third and fifth segments; fifth segment (propodus) comprising about two-thirds length of entire appendage⁷—palm slightly concave in outline, bearing a "poison tooth" at base and a rectangular projection distally; sixth segment (dactylus) curved, crooked, and denticulate on distal half of inner edge.

Pereopods on pereods 5 (fig. 5), 6, and 7 set with spine-like hairs; palm of propodus of each bearing a pair of grasping spines proximally and two rows of spine-like hairs, each row consisting of 10-12 hairs (only one spine and one row of hairs can be shown in view depicted in fig. 5).

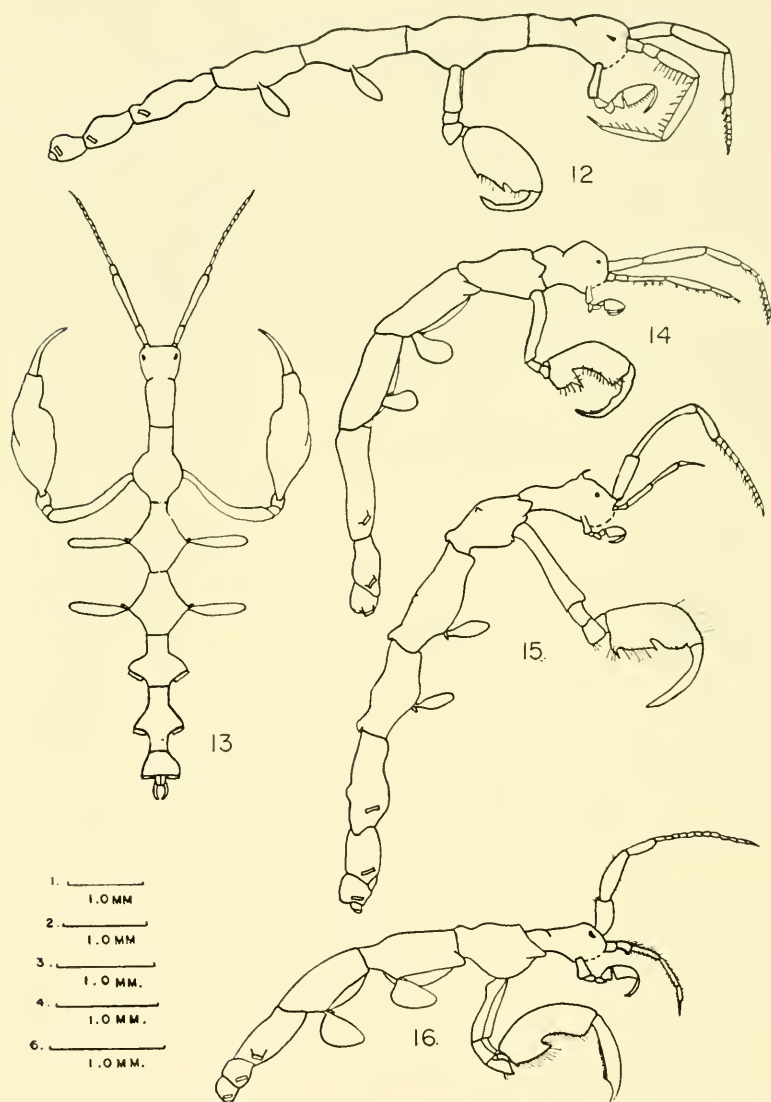
A large male measured 10 mm in length; a large female, 9.5 mm.

Occurrence.—*Type locality:* Charleston, South Carolina—on *Tubularia* (Mayer, 1890, as *C. acutifrons* var. *carolinensis*). *Other previous records:* 10.5 fathoms at Fish Hawk station 7292 off Northwest Channel (Key West), Gulf of Mexico (Pearse, 1913—as *C. geometrica*); north jetty at Galveston, Texas, and northeast jetty at Freeport, Texas—on algae (e.g., *Cladophora*) in association with *Carinogammarus* (Whitten, Rosene, and Hedgpeth, 1950—as *C. acutifrons*). *New records:* north jetty at Port Isabel, Texas—10 males and 2 females, collected Mar. 20, 1947 (Dr. Joel W. Hedgpeth); "probably Port Aransas," Texas—1 female (Dr. Hedgpeth); Gulf Beach, Port Aransas—4 males and 6 females (together with 9 males and 7 females of *Paracaprella pusilla*) from fouling organisms on fishing pier, collected Sept. 19, 1954 (Dr. Henry Hildebrand); Alligator Harbor,

⁵ Here and in all subsequent descriptions in which the length of gnathopods (either first or second) is reckoned and compared with that of other anatomical parts, the length of the dactylus has been omitted by reason of the confusion that might arise from the fact that the dactylus may be extended or closed.

⁶ In our earliest paper (Dougherty and Steinberg, 1953) we referred to these segments as the "coxa" and "basis", respectively, and subsequently in a key (Dougherty and Steinberg, 1954) used the term "coxa" in this manner. In accordance with the usage of Snodgrass (1952, p. 185) these should, however, be known as the "basipodite" (or basis) and "ischipodite" (or ischium) respectively, the true "coxopodite" (or coxa) of thoracic limbs having become fused with their respective body segments (pereods) in most of these peracaridan Crustacea.

⁷ See footnote 5.



Figures 12-16. Adult males (with pereopods of pereopods 5-7 missing). 12. *Caprella* sp.; 13. *Hemiaegina minuta* (antennae not shown; palms of propodi of 2nd gnathopods directed downward); 14. *Dentella abra-cadabra*; 15. *D. californica*; 16. *Paracaprella pusilla*. (Fig. 12, scale 4; fig. 13, scale 5; fig. 14, scale 1; fig. 15, scale 3; fig. 16, scale 2.)

Franklin County, Florida—1 female on *Bugula neritina*, dredged Mar. 13, 1954 (Dr. Harold J. Humm); at South Pier, Mustang Island Beach, Port Aransas, from fouling on dorsum of dead *Caretta*—approximately 2500 specimens, collected Mar. 21, 1955 (Mr. C. E. Dawson).

Discussion.—Our specimens differ from Mayer's description of *Caprella acutifrons* var. *carolinensis* only in the number of spine-like hairs on the palm of the propodus of the appendages on the fifth pereod. Mayer's specimens had seven; ours have 10-12.

Two other members of the *Caprella "acutifrons"* group have been described from the East coast of the United States: *Caprella geometrica* Say, 1818, from "salt water bays" and *Caprella acutifrons* var. *virginia* Mayer, 1890, from Old Point Comfort, Virginia. Mayer (1882) did not consider *C. geometrica* a separate species, but synonymized it with *Caprella acutifrons* Latreille, 1816.⁸ Later (1890, 1903), however, he neither recognized it as a distinct variety, nor placed it in one of this named varieties. (He began the naming of varieties in *C. acutifrons* in his second monograph—1890.) We are of the opinion that it merits full specific rank. Therefore, the problem arises as to which of Mayer's "varieties", if any, is synonymous with *C. geometrica*. Having examined material from Woods Hole, Massachusetts, loaned by Dr. Waldo L. Schmitt from the U.S. National Museum, and from the vicinity of the Narragansett Marine Laboratory, Rhode Island, collected for us by Dr. Thomas E. Bowman, we have come to the conclusion that animals of the *C. "acutifrons"* type from these areas belong to *C. geometrica* as described by Say and differ from *C. carolinensis*, especially in the form of the propodus of the second gnathopod. The palm thereof in *C. geometrica* lacks a distal rectangular projection, which is present in *C. carolinensis*.

Unfortunately we have no specimens of *C. acutifrons* var. *virginia* and so are unable at this time to make any statements regarding its relationships and taxonomic position. It may be that the three forms under consideration represent variation within a single species of wide distribution along the East coast and into the Gulf. However, until such a condition can be shown to exist, we prefer to recognize at least *C. geometrica* and *C. carolinensis* as separate species.

CAPRELLA EQUILIBRA SAY, 1818

(Figures 1, 2)

Synonymy.—See Stebbing (1888: 1254-1255); *Caprella mendax* Mayer, 1903.

Diagnosis.—*Caprella*: cephalon smooth; pereods 2-5 smooth dorsally (fig. 1), pereod 2 bearing an anteriorly directed spine at base of each second gnathopod and a median ventral spine between these appendages; pereods 3 and 4 each bearing a spine at the anterior,

⁸ The specific name "*acutifrons*" is, we feel, invalid; but an analysis of this point is beyond the scope of the present paper.

ventrolateral edge of the segment; pereods 6 and 7 each bearing a pair of low dorsal tubercles. Cephalon and second pereod subequal; pereods 3-5 all approximately of equal length and, combined, slightly longer than cephalon; pereods 6 and 7, combined, as long as fifth pereod. Gills elliptical and somewhat elongate.

Antennule one-half length of body; flagellum composed of 9-14 segments and comprising one-fourth or less of entire antennule. Antenna approximately one-half length of antennule and bearing natatory hairs.

First gnathopod small. Second gnathopod a little less than one-third length of entire body and attached to posterior part of second pereod in male and at anterior end in female; basis comprising about one-fourth entire appendage and bearing an anterior ridge ending in a sharp projection on both outer and inner edges; ischium and merus each bearing a smaller projection posteriorly; propodus comprising about one-half entire appendage, with palm nearly straight in outline and bearing a "poison tooth" just distally to base and, more distally still, a triangular projection, proximally to which is a small spine; dactylus curved and crooked.

Pereopods on pereods 5 (fig. 2), 6, and 7 progressively larger posteriorly; palm of propodus of each bearing a pair of small spines (only one shown in fig. 2) one-third of way distally from base; distal two-thirds concave and bearing numerous small hairs.

Largest male measured 19 mm in length; largest female, 11 mm.

Occurrence.—*Type locality:* around Charleston, South Carolina (Say, 1818). *Other records:* cosmopolitan. *New records:* Port Aransas, Texas—14 males and 6 females from buoy, collected Apr. 14, 1948, and 1 male, collected Mar. 15, 1948 (Dr. Hedgpeth); on dock at Institute of Marine Science, Port Aransas, Texas—about 700 individuals from fouling on oyster shell bags, collected Apr. 5, 1953 (Mr. C. E. Dawson).

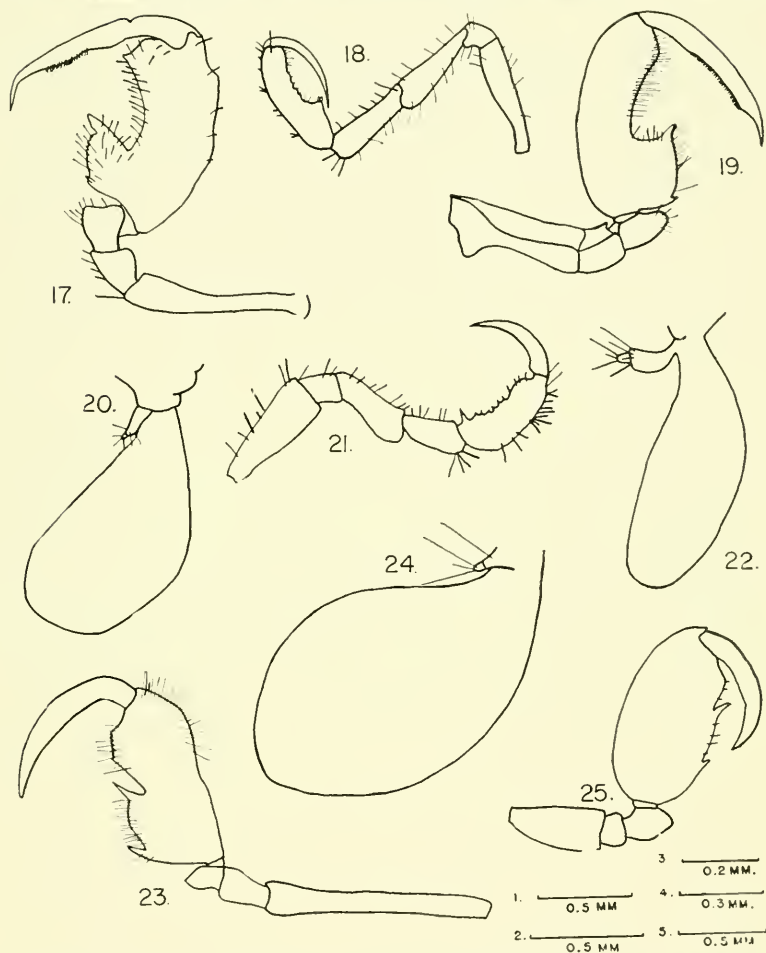
Discussion.—This cosmopolitan species was originally described by Say (1818) from specimens collected as indicated. It was recorded from this region again by Mayer (1890), who also found it in Bermuda (1903). It has, in addition, been listed by Kunkel (1910) as occurring in Bermuda. It has not hitherto been recorded from the Gulf of Mexico.

The males collected from the buoy at Port Aransas in April, 1948, are smaller than the single male collected from Port Aransas (location not noted) in March of the same year. The largest in the April collection measures only 10 mm. However, except for size, these animals are all morphologically similar.

CAPRELLA sp.
(Figures 12, 25, 26)

Synonymy.—? *Caprella* sp., of Pearse, 1913.

Diagnosis.—*Caprella*: entire body smooth, slender (fig. 12). Cephalon and pereods 4 and 5 of equal length and slightly shorter than



Figures 17-25. Appendages of adult males. **17.** *Dentella abracadabra*, 2nd gnathopod; **18.** *D. abracadabra*, 1st complete pereopod (i.e., of 5th pereod); **19.** *Paracaprella pusilla*, 2nd gnathopod; **20.** *Dentella abracadabra*, 1st gill and associated vestigial appendage (i.e., of 3rd pereod); **21.** *D. californica*, 1st complete pereopod (i.e., of 5th pereod); **22.** *D. californica*, as in fig. 20; **23.** *D. californica*, 2nd gnathopod; **24.** *Paracaprella pusilla*, as in fig. 20; **25.** *Caprella* sp., 2nd gnathopod. (Figs. 17 and 25, scale 1; fig. 18, scale 4; figs. 19 and 23, scale 5; figs. 20, 22, 24, scale 3; fig. 21, scale 2.)

pereod 3; pereods 2 and 3 of nearly equal length; pereods 6 and 7, combined, equal to pereod 5 in length. Gills lanceolate in outline and somewhat elongate.

Antennule about one-third length of body; flagellum composed of

seven segments and comprising one-third length of entire antennule. Antenna slightly longer than antennule and bearing natatory hairs on inner surface, except for first two segments of peduncle; flagellum composed of two segments. Mandible without palp.

First gnathopod about as long as cephalon. Second gnathopod (fig. 25) roughly one-fourth length of body and attached just posteriorly to middle of second pereopod in male; basis comprising one-third length of entire appendage and bearing an outer anterior ridge; propodus a little over one-half length of appendage with palm slightly convex in outline and bearing a proximal tooth one-third, and a "poison tooth" two-thirds, of way distally from base—latter separated from distal third of palm by shallow cleft; dactylus slightly curved, with tip tapered.

As characteristic of *Caprella*, no appendages (other than gills) on pereopods 3 and 4. Pereopods on pereopods 5-7 missing in our specimens.

Abdomen in male bearing "1½ pairs" of appendages (vestigial uropods—i.e., a rudimentary, one-segmented, ventrally located pair followed posteriorly by a pair of lappets [= "½ pair" of Mayer], representing an almost vanished second pair; see fig. 26).

Both males measured 6 mm in length.

Occurrence.—Between delta of Mississippi and Cedar Keys, Florida; Albatross station 2387—1 juvenile male at 32 fathoms, and Albatross station 2389—1 juvenile female at 27 fathoms, both collected Mar. 4, 1885 (U. S. National Museum collection); "probably Port Aransas", Texas—1 juvenile male (Dr. Hedgpeth).

Discussion.—Only the three specimens indicated in the foregoing paragraph have been available to us—two juvenile males, which fit the foregoing description, and one juvenile female, which we tentatively refer to the same species. All undoubtedly belong to the genus *Caprella* and somewhat resemble *C. bermudia* Kunkel, 1910. However, the antennae are slightly longer than the antennules in our specimens, and somewhat shorter in *C. bermudia*. Also the males of the former lack the ventral process between the 2nd gnathopods and the serrations on the anterior ridges of the bases of these appendages as described for *C. bermudia*. Until more specimens, including definite adults, are available, we feel it best to designate these animals as *Caprella* sp.

Pearse (1913) reported a female of a *Caprella* sp.? collected from "Albatross stations 2369-2374" between the delta of the Mississippi and Cedar Keys, Florida, at 25-27 fathoms. This specimen could belong to the same species as ours inasmuch as the collecting stations are very close and as the specimens were recovered by dredging in both cases; but, since Pearse published no description and since we have not (at least as yet) studied his specimen, we cannot be certain for the present.

DEUTELLA ABRACADABRA⁹ sp. nov.

(Figures 14, 17, 18, 20, 27)

Diagnosis.—*Deutella*: entire body smooth (fig. 14). Second pereod bearing an anteriorly directed, triangular projection laterally on anterior edge; third pereod bearing a similar projection on anterior, ventrolateral edge. Cephalon and second pereod of nearly equal length; third, fourth and fifth pereods all approximately of equal length; sixth and seventh pereods, combined, two-third of fifth pereod. Gills oval (fig. 20), those on pereod 3 larger than those on pereod 4.

Antennule little more than one-third length of body; flagellum just less than one-half length of peduncle and composed of 8-10 segments in male and 5-8 segments in female. Antenna two-thirds length of antennule and bearing sensory hairs. Mandibular palp three-segmented.

First gnathopod as long as peduncle (first three segments) of antenna. Second gnathopod (fig. 17) about one-third length of body and attached at anterior end of pereod in both sexes; basis about equal in length to propodus; carpus set anteriorly to merus so that propodus appears to be resting on both; propodus in male about one-half length of entire appendage, with palm bearing long hairs—"poison tooth" located on shelf about one-third of way distally along palm—a single grasping spine located at base of palm, and area between it and "poison tooth" denticulate—middle of palm deeply concave and distal part bearing a triangular projection, the anterior edge of which is minutely denticulate (in female, palm of propodus slightly convex and lined with small hairs bearing a single grasping spine at base and a very small spine near distal end); dactylus curved, irregular on inner surface, and bearing a row of short, stiff hairs distally.

Appendages on pereods 3 and 4 each two-segmented and attached at bases of gills in males (fig. 20), each segment bearing three hairs; gills on pereod 4 in females attached to posterior brood pouch below attachment of appendages. Pereopods on pereods 5 (fig 18), 6, and 7 progressively smaller in size; palmar surface of each concave with a pair of grasping spines proximally.

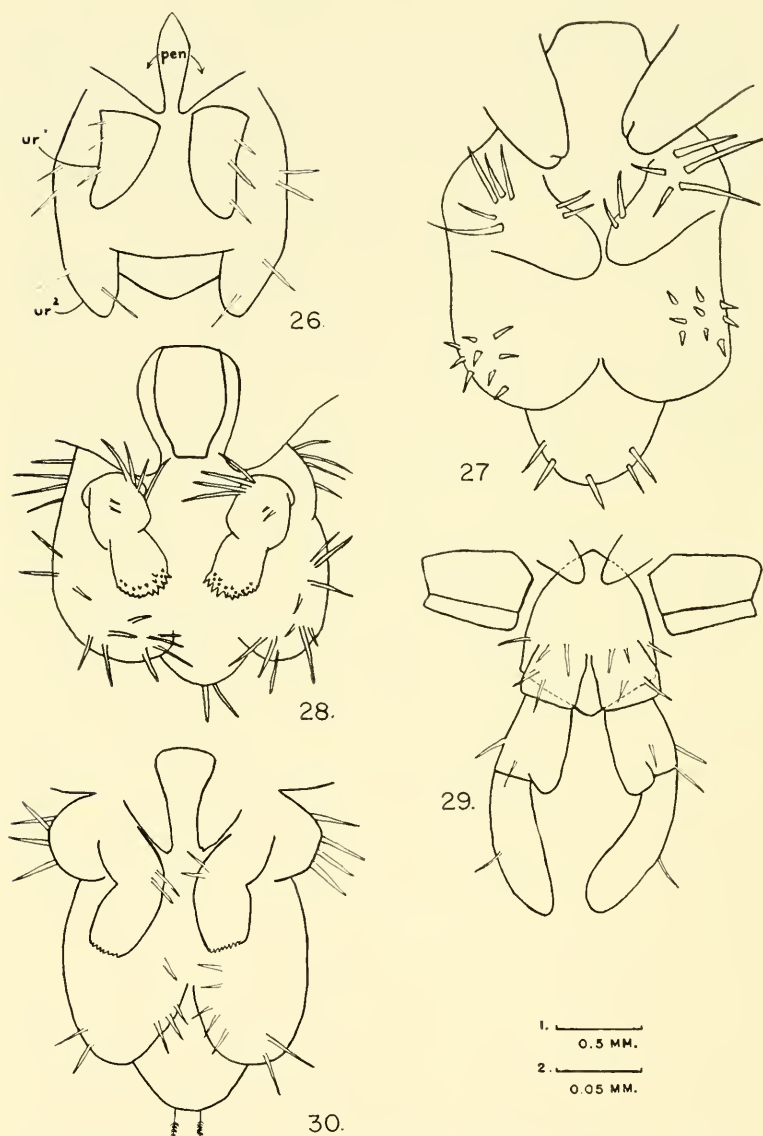
Abdomen in male (fig. 27) bearing "1½ pairs" of appendages; female abdomen bearing "½ pair" (*i.e.*, a pair of lappets only). Posterior brood pouch of female with no hairs.

A large male measured 6 mm in length; a female, 5 mm.

Type specimen.—Adult male: U.S. National Museum catalog number 97624.

Occurrence.—*Type locality*: Alligator Harbor, Franklin County, Florida—10 males and 1 female on *Bugula neritina*, dredged Mar. 13, 1954 (Dr. Harold J. Humm). *Other record*: off Ship Island, Mississippi—6 males and 7 females from ?*Crisia* in surf, collected May 10, 1954 (Dr. Ellinor H. Behre).

⁹ Specific name selected because it is bizarre, in keeping with the bizarre nature of the skeleton shrimps.



Figures 26-30 Abdomina of adult males. **26.** *Caprella* sp.: *pen.*—penes; *ur*¹, *ur*²—vestigial uropods; **27.** *Deutella abracadabra*; **28.** *D. californica*; **29.** *Hemiaegina minuta*; **30.** *Paracaprella pusilla*. (Figs. 26, 27, 28, and 30, scale 1; fig. 29, scale 2.)

Discussion.—See under *Deutella californica*, the description of which follows immediately.

DEUTELLA CALIFORNICA MAYER, 1890

(Figures 15, 21-23, 28)

Diagnosis.—*Deutella*: cephalon bearing a small, pointed erect spine in male and a low blunt tubercle in female; rest of body (fig. 15) smooth except for a pair of low, bluntly pointed tubercles located on either side of dorsal median line above second gnathopods; a rudimentary median pair of tubercles may or may not be present above gills on pereods 3 and 4; posterodorsal regions of pereods 2, 3, and 4 each projecting upwards in median line; female bearing a single low tubercle in median line dorsally in middle of third pereod; second pereod bearing an anteriorly directed triangular projection on anterior edge of segment; third and fourth pereods approximately equal in length, with pleura weakly developed; fifth, sixth, and seventh pereods progressively shorter—sixth and seventh combined, about two-thirds length of fifth. Gills elliptical and somewhat elongate (fig. 22).

Antennule one-half as long as body; middle segment of peduncle curved; flagellum almost two-thirds length of peduncle and composed of 8-12 (usually 11) segments in male and 7-10 (usually 9) segments in female. Antenna a little less than one-half as long as antennule and bearing a few sensory hairs; second segment of flagellum teardrop-shaped. Mandibular palp three-segmented.

First gnathopod a little longer than 1st segment of antennule. Second gnathopod (fig. 23) two-fifths length of body and attached anteriorly to middle of second pereod in males and at anterior end in females; ischium and merus short, and carpus very short and wedge-shaped; propodus about twice as long as broad and bearing a "poison tooth" halfway along palmar surface, separated from distal part of palm by a deep cleft—another small tooth at base of palm and separated from rest of palm by a very small cleft in which dactylus rests when closed—palmar surface just distal to large cleft coarsely denticulate for one-half distance from cleft to articulation of dactylus—entire palmar surface (and also distal region of propodus) bearing many long hairs (in female, palm of propodus nearly straight and bearing a small tooth at base—palmar surface lined with short hairs); dactylus sharply bent near proximal end and distally thereafter almost straight, with minute denticulations on inner surface.

Appendages on pereods 3 and 4 each consisting of two segments attached to bases of gills in males (fig. 22); in females, gills on pereod 4 attached to posterior brood pouch below attachment of appendages; pereopods on pereods 5 (fig. 21), 6, and 7 all normal (six-segmented); palmar surface concave, with a proximal tooth.

Abdomen in male (fig. 28) bearing "1½ pairs" of appendages and having a chitinous plate between penes; female abdomen bearing "1½

pair" of appendages. Leaves of posterior brood pouch of females sparsely haired.

A large male measured 8 mm in length; a female, 5½ mm

Occurrence.—*Type locality:* Cape Mendocino, California (Mayer, 1890). *Other previous records:* Monterey wharf in Monterey Bay, California—on campanulariid hydroids; also at Mussel Point, ?substrate (Dougherty and Steinberg, 1953). *New record:* "probably Port Aransas, Texas"—8 males and 7 females (Dr. Hedgpeth).

Discussion.—*Deutella abracadabra* differs from *D. californica* (type species of *Deutella* Mayer, 1890, as selected by Dougherty and Steinberg, 1953, p. 48) in being entirely smooth and in having a different form to the palm of the propodus of the second gnathopod, as may be seen by comparing figs. 17 (*D. abracadabra*) and 23 (*D. californica*). The abdomen of the male of *D. abracadabra* (fig. 27) lacks the chitinous plate found between the penes of *D. californica* (fig. 28); the first pair of vestigial uropods are incipiently two-segmented in the latter, clearly one-segmented in the former.

Another species of *Deutella*, *D. mayeri*, was described by Stebbing (1895) from Antigua in the West Indies. *D. abracadabra* resembles this species in being entirely smooth, but differs from it especially in the form of the propodus of the second gnathopod. The palm of *D. abracadabra* bears a large proximal shelf comprising about one-third of the palmar surface and one triangular tooth at the distal end, whereas that of *D. mayeri* has what amounts to only a large tooth proximally and bears two triangular teeth distally, the more proximal one being acute, the other obtuse. The number of segments in the flagellum of the antennule also differs, there being six in the male and five in the female of *D. mayeri*, whereas the male of *D. abracadabra* has 8-10, the female, 5-8. *D. mayeri* lacks the anteriorly directed triangular projections that occur laterally on the anterior edges of pereopods 2 and 3 in *D. abracadabra*.

The remaining named species already referred to this genus (*Deutella venenosa* Mayer, 1890, from Coquimbo, Chile) bears a forward directed spine on the cephalon, as does *D. californica*, but the spination of the rest of the body differs markedly between the two, as does the form of the palm of the second gnathopod. The form of this palm in *D. venenosa* is quite similar to that in *D. mayeri*, but the two species otherwise differ importantly in that the former is spinous and the latter, as already noted, is entirely smooth. The abdomen of the male of *D. abracadabra* (fig. 27) resembles that of *D. venenosa* in general, but differs in details (see Mayer, 1890, Taf. 5, fig. 19).

Mayer (1890) described a single female, which he referred to *Deutella*, from one of the Pontine Islands in the Mediterranean Sea. It was quite smooth dorsally and had five segments in the flagellum of the first antenna. In these two respects it differs from *D. californica* and *D. venenosa*, but resembles *D. mayeri* and *D. abracadabra*. Until

the male of this *Deutella* sp. is found, however, no conclusions may be made as to its relationship to the latter two species.

In addition to the foregoing four named and one unnamed species already referred to *Deutella*, we believe that the species *Luconacia incerta* Mayer, 1903, only (hence type) species of the genus *Luconacia* Mayer, 1903, also belongs in that genus—as *Deutella incerta* (Mayer, 1903) comb. nov., of which, as we state in the introduction, we consider *Protellopsis stebbingi* Pearse, 1908, to be a synonym.

The abdomen of *Protellopsis stebbingi* Pearse, 1908, is significantly different from that of *Protellopsis kergueleni* Stebbing, 1888—only (hence type) species of the genus *Protellopsis* as established by Stebbing (1888). In the male of the latter, there are two clearly evident pairs of vestigial appendages, plus, apparently, a pair of lappets representing a third pair, whereas in the male of the former there is but one pair of distinct vestigial appendages, plus a definite pair of lappets. However, when compared to the illustration of the abdomen of *Luconacia incerta* given by Mayer (1903), it is obvious that *Protellopsis stebbingi* is closely allied to *Luconacia*, and further comparison of Pearse's illustrations and descriptions with Mayer's reveal that *P. stebbingi* is definitely synonymous with *Luconacia incerta*.

The genus *Luconacia* as set up by Mayer differs from *Deutella* in the form of the propodus of the appendage on the fifth pereod. In the former, this segment lacks a definitive palmar surface and is not unlike the carpus, but, in the latter, has a concave palmar surface, on which denticulations are borne. Mayer includes the presence of swimming hairs on the antennae (as are characteristic of *Caprella*) as one of the distinguishing features of the genus, but neither Pearse's nor Kunkel's figures show them to be greatly developed. These are not present in the species heretofore placed in *Deutella*. All of these differences seem minor to us and thus not to justify the separation of *Deutella* and *Luconacia*, the latter therefore falling as a subjective junior synonym of the former.

Deutella abracadabra sp. nov. is accordingly the first species of the genus *Deutella* Mayer, 1890, to be described since *D. incerta* and makes a total of five named and one unnamed species in the genus.

HEMIAEGINA MINUTA MAYER, 1890

(Figures 8-11, 13, 29)

Synonymy.—*Hemiaegina quadripunctata* Sundara Raj, 1927; *Hemiaegina ?minuta*, of Barnard, 1937.

Diagnosis.—*Hemiaegina*: entire body smooth (fig. 13) except for a pair of spines ventrally between second gnathopods; pereods 2-6 appear from above somewhat hexagonal in outline; second and third pereods equal in length; third, fourth and fifth pereods progressively shorter; sixth as long as fourth pereod, and seventh shortest of all. Gills oval and quite elongate.

Antennule about two-fifths length of body; second segment of peduncle extremely long, first and third quite short; flagellum of approximately same length as peduncle and composed of 11-13 segments in both sexes. Antenna as long as peduncle of antennule and bearing a few sensory hairs; flagellum two-segmented. Mandibular palp absent.

First gnathopod (fig. 8) one-half length of antenna; palm of propodus nearly straight and bearing a proximal lobe. Second gnathopod (fig. 9) about two-thirds length of body and attached to middle of second pereod; basis long and club-shaped; propodus comprising slightly over one-half length of entire appendage and almost twice as long as broad, with palm bearing "poison tooth" one-third of way distally from base, convex in middle third, and there bearing a small tooth in adult males (more distally in females and sometimes absent in juveniles)—distal third of palm bearing a shelf, which is separated from rest of palm by a cleft and bears two small teeth and a few short hairs; dactylus crooked and finely denticulate on inner surface.

Appendages on pereods 3 and 4 very small; each consisting of one segment and attached to bases of gills (fig. 10). Appendages on pereods 5-7 normal (six-segmented), increasing in size from 5 to 7; palm of propodus of appendage on pereod 5 (fig. 11) and 6 irregular and bearing a single tooth proximally; palm of propodus of appendage on pereod 7 more concave and bearing a large proximal tooth in addition to smaller ones.

Abdomen of male bearing one pair of two-segmented appendages (fig. 29); abdomen of female similar to that of male.

A large male measured 4 mm in length; a female, also 4 mm.

Occurrence.—*Type locality:* 8-25 fathoms, rocky ground, 15 miles outside of Amoy, China (Mayer, 1890). *Other previous records:* Station 164, Siboga Expedition (Mayer, 1903); 1°42'5" S; 130°47'5" E—at 32 meters (Mayer, 1903); Pamban Bridge, Krusadai Island, Gulf of Manaar, India (Sundara Raj, 1927—as *Hemiaegina quadripunctata*); Station 51, South Channel, Cockburn Sound,¹⁰ region of Fremantle, Australia—at 6½-8 meters (Mayer, 1912); Waikiki Reef, Oahu, Hawaii—on a plumularian hydroid in shallow water (Edmondson and Mansfield, 1948); South Arabian coast (Barnard, 1937—as *Hemiaegina ?minuta*). *New record:* Port Aransas, Texas—10 males and 9 females on sargassum floating by dock, collected in July and Aug. 1948 (Dr. Hedgpeth).

Discussion.—These specimens agree with *Hemiaegina minuta* as described by Mayer (1890) and also with specimens as described by Edmondson and Mansfield (1948) from Hawaii.

Sundara Raj (1927) described a species of *Hemiaegina* from India, *H. quadripunctata*, which he claimed differed from the type of the genus in the form of the cleft on the palm of the second gnathopod,

¹⁰ 32° 10' S; 115° 45' E.

his specimens having what he termed a "squarish" rather than an angular one, and in the number of segments in the flagellum of the antennule, his having only 11 as compared to the 13 of *H. minuta*. However, he stated that his "species" might be only a variety of *H. minuta*. Our specimens from the Gulf of Mexico show a variation in the number of segments of this appendage from 11 to 13, thus lending support to this opinion. We believe that *H. quadripunctata* Sundara Raj, 1927, should fall as a synonym of *H. minuta*. In keeping with this, the locality for the former has been included in the above list of occurrences of *H. minuta*.

Barnard (1937) recorded a male of "*Hemiaegina ?minuta*", which he stated was lacking the second gnathopods and therefore could not be differentiated from *H. quadripunctata*. Since we have submerged the latter nominal species as a synonym of *H. minuta*, we have included Barnard's record as applying to *H. minuta*.

PARACAPRELLA PUSILLA MAYER, 1890

(Figures 16, 19, 24, 30)

Synonymy.—*Caprella* sp., of Hedgpeth, 1950.

Diagnosis.—*Paracaprella*: entire body smooth (fig. 16); second pereod in male bearing an anteriorly directed, triangular projection on anterolateral edge; pleura on pereod 3 weakly developed anteriorly. Cephalon and second pereod nearly equal in length, latter three-fifths length of pereod 3; pereods 3, 4, and 5 approximately equal in length; pereods 6 and 7, combined, two-thirds as long as pereod 2. Gills oval to elliptical and directed anteriorly (fig. 24).

Antennule one-half length of body; flagellum composed of 12 segments in male and 8-10 segments in female; flagellum comprising one-half length of entire antennule. Antenna one-half length of antennule, second segment bearing a small, downward directed projection anteriorly; flagellum composed of two segments and bearing many sensory hairs. Mandibular palp absent.

First gnathopod nearly as long as antennule. Second gnathopod (fig. 19) slightly less than one-half length of body and attached at middle of second pereod; basis almost as long as propodus and triangular in cross section, bearing a rounded projection on posterior edge near point of proximal attachment; ischium bearing two low, lateral, longitudinal ridges; propodus about one-half length of entire appendage, with "poison tooth" located on shelf nearly half way distally from base of palm and with distal palmar surface concave—all of palm covered with hairs; dactylus with nearly straight inner border, latter hairy in middle two fourths and quite narrow in distal fourth.

Rudimentary appendages on pereods 3 and 4 each two-segmented and attached to bases of gills (fig. 24), with proximal segment bearing stiff hair and distal segment bearing three terminal hairs. Pereopods on pereods 5-7 missing in our specimens.

Abdomen bearing "1½ pairs" of appendages in male (fig. 30) and "½ pair" in female.

The largest male measured 6 mm in length; a female, 4 mm.

Occurrence.—*Type locality*: Rio de Janeiro—on ascidians (Mayer, 1890). *Other previous records*: Desterro, Brazil; Fort de France and St. Anne, Martinique; Kingston, Jamaica—from the sides of a lighter six weeks within the harbor ((all records of Mayer, 1903). *Dar es Salaam*¹¹ (Schellenberg, 1928); Suez Canal: Kantara, Station Km. 46; Kabret Signal Station, Station K.O; Port Taufiq bathing place, Station PT.3 (all records of Schellenberg, 1928—see Munro Fox, 1929, for description of collecting stations). Honolulu Harbor, Hawaii—from screen of an intake water pipe of Hawaiian Electric Co. and on *Pennaria* sp. (Edmondson and Mansfield, 1948). *New records*: Port Aransas, Texas—2 males and 3 females collected Nov. 20, 1947 (Dr. Hedgpeth) and 9 males and 7 females (together with 4 males and 6 females of *Caprella carolinensis*) from fouling organisms of Gulf Beach fishing pier, collected Sept. 19, 1954 (Dr. Hildebrand).

Discussion.—The specimens from the Gulf of Mexico agree with Mayer's description of *Paracaprella pusilla* in body outline as he described it in his "Nachtrag" (1890), but are slightly larger and bear more segments in the flagellum of the antennule. In size and in the number of segments of this appendage they are identical with the animals he described in his 1903 paper. They differ from these, however, in lacking a small tubercle on the anterodorsal part of the second pereopod, but this feature was apparently absent in the specimens that he described in the "Nachtrag", since he made no mention of it.

As already mentioned in the introduction, Whitten, Rosene, and Hedgpeth (1950) and Hedgpeth (1950) spoke of an unidentified "green" *Caprella* sp., which occurred together with "*C. acutifrons*" (= *C. carolinensis*), but was less common and apparently smaller than the latter. Unfortunately we have so far been unable to obtain specimens from the Gulf whose color description in the living state has been recorded as green. However, since the specimens of *C. carolinensis* and *P. pusilla* received by us from Dr. Hildebrand were collected together and are not inconsistent with Dr. Hedgpeth's account, we believe by the process of elimination that the latter's "*Caprella* sp." was most probably *P. pusilla*.

KEY TO THE CAPRELLIDAE OF THE GULF OF MEXICO

- | | |
|--|--------------------------|
| 1. Vestigial appendages on pereopods 3 and 4 | 2 |
| No vestigial appendages on pereopods 3 | |
| and 4 (<i>Caprella</i>) | 6 |
| 2. Appendages on pereopods 3 and 4 one-seg- | |
| mented | <i>Hemimegina minuta</i> |

¹¹ 6°50' S; 39°17' E.

Appendages on pereods 3 and 4 two-segmented	3
3. Mandibular palp absent	<i>Paracaprella pusilla</i>
Mandibular palp present (<i>Deutella</i>)	4
4. Palm of propodus of appendage on pereod 5 straight and lacking denticulations, two spines on cephalon	<i>Deutella incerta</i>
Palm of propodus of appendage on pereod 5 concave and bearing denticulations; one or no spine on cephalon	5
5. One spine on cephalon	<i>Deutella californica</i>
No spine on cephalon	<i>Deutella abracadabra</i> sp. nov.
6. With spine ventrally between second gnathopods	<i>Caprella equilibra</i>
Without spine ventrally between second gnathopods	7
7. With spine on cephalon	<i>Caprella carolinensis</i>
Without spine on cephalon	<i>Caprella</i> sp.

SUMMARY

1. Descriptions based on original material are herein given for seven species of skeleton shrimps found in various parts of the Gulf of Mexico. Study of earlier reports has revealed that two of these seven have previously been recorded: *Caprella carolinensis* Mayer, 1890 (as *Caprella acutifrons*) and *Hemiaegina minuta* Mayer, 1890 (figured but not named); a third, *Paracaprella pusilla* Mayer, 1890, is probably the same as *Caprella* sp. of Hedgpeth, 1950, a form reported from the Gulf, but described merely as "green" and smaller than *C. carolinensis*; and the remaining four are new records. Of the last group, two (*Caprella equilibra* Say, 1818, and *Deutella californica*, Mayer, 1890) are known from other areas; and descriptions of two (*Deutella abracadabra* sp. nov. and *Caprella* sp.) are new to science, the latter species being left unnamed, however, because of inadequate material.

2. An eighth species, hitherto known as *Luconacia incerta* Mayer, 1903, was not found among our specimens. [See Addendum.] Nevertheless, it is herein transferred on the basis of its original description to the genus *Deutella* Mayer, 1890. *Protellopsis stebbingii* [sic] Pearse, 1908, is here synonymized with *Deutella incerta* (Mayer, 1903) comb. nov. on the basis of comparison of Pearse's and Mayer's descriptions and figures.

3. *Hemiaegina quadripunctata* Sundara Raj, 1927, originally described from India, is herein suppressed as a synonym of *Hemiaegina minuta* Mayer, 1890—one of the seven species here treated.

4. A key to the eight described species of caprellids found in the Gulf of Mexico is provided.

ADDENDUM

Since the completion of this paper, reëxamination of the material from Alligator Harbor, Franklin Co., Florida, has revealed an immature female belonging to the genus *Deutella*, but not to the species

D. abracadabra; it bears a pair of minute spines on the cephalon and one slender spine dorsolaterally on the left side of the second pereod—no corresponding spine is evident on the right side, but may have been knocked off. The appendages on the fifth and subsequent pereods are missing.

The vestigial appendages on pereods three and four are larger than in *Deutella abracadabra*, but the palmar surface of the propodus of the second gnathopod is nearly identical with that of a female *D. abracadabra*, being slightly convex and set with hairs, with a small grasping spine proximally. The specimen is 4 mm long.

We are reasonably sure that this represents an immature female of *Deutella incerta*. It thus appears that all named species hitherto recorded from the Gulf are represented in our collection.

REFERENCES CITED

- BARNARD, K. H. 1937. Amphipoda. *Sci. Rept. John Murray Exped. 1933-34* (Brit. Mus. [Nat. Hist.]), 4(6): 131-201, 21 figs. (*Hemimaegina ?minuta*, p. 198.)
- BATE, C. SPENCE.—*Vide* SPENCE BATE, C.
- DOUGHERTY, E. C. and J. E. STEINBERG 1953. Notes on the skeleton shrimps (Crustacea: Caprellidae) of California. *Proc. Biol. Soc. Wash.*, 66(7): 39-50.
- . 1954. Key to the Caprellidae of California. Pp. 168-171 (fig. 82) in Light, S. F., R. I. Smith, et al., *Intertidal Invertebrates of the Central California Coast*. University of California Press, Berkeley and Los Angeles.
- EDMONDSON, C. H. and G. S. MANSFIELD 1948. Hawaiian Caprellidae. *Occ. Pap. Bernice P. Bishop Mus.*, 19(10): 201-218, 8 figs.
- FOX, H. MUNRO.—*Vide* MUNRO FOX, H.
- GURIANOVA, E. F. (ГУРЬЯНОВА, Е. Ф.) 1951. Боконпавы морей СССР и сопредельных вод (Amphipoda-Gammaridea). Определ. по Фауне СССР [*Keys to the Fauna of the USSR*], 41: 1-1029 + [3].
- HEDGPETH, J. W. 1950. Annotated list of certain marine invertebrates found on Texas jetties. Pp. 72-85 in Whitten, H. L., H. F. Rosene, and J. W. Hedgpeth (1950—*vide*).
- . 1953. An introduction to the zoogeography of the northwest Gulf of Mexico with reference to the invertebrate fauna. *Publ. Inst. Marine Sci. Univ. Texas*, 3(1): 107-224, 46 figs., 7 tabs. (Caprellidae, p. 208, fig. 46.)
- KUNKEL, B. W. 1910. The Amphipoda of Bermuda. *Trans. Conn. Acad. Arts Sci.*, 16(1): 1-115, 43 figs. (Caprellidae, pp. 106-113.)
- MAYER, P. 1882. Die Caprelliden des Golfes von Neapel und der angrenzenden Meeres-Abschnitte. Eine Monographie. *Fauna u. Flora Golf. Neapel*, 6: i-x, 1-201, 10 pls., 39 figs.
- . 1890. *Idem*. Nachtrag zur Monographie derselben. *Ibid.*, 17: i-viii, 1-157, 7 pls.
- . 1903. Die Caprellidae der Siboga-Expedition. *SI-BOGA-Exped.*, 34: 1-160, 10 pls.
- . 1912. Caprellidae. In W. Michaelson and R. Hartmeyer (Eds.) *Die Fauna Südwest-Australiens*, 4(1): 1-14, 5 figs.
- MUNRO FOX, H. 1928. General part. (*In* Zoological Results of the

- Cambridge Expedition to the Suez Canal, 1924). *Trans. Zool. Soc. London*, 22(1): 1-64, 3 figs., 5 maps.
- PEARSE, A. S. 1908. Descriptions of four new species of amphipodous Crustacea from the Gulf of Mexico. *Proc. U. S. Nat. Mus.*, 34, no. 1594: 27-32, 4 figs. (*Protellopsis stebbingii*, pp. 30-32, fig. 4.)
- 1913. Notes on certain amphipods from the Gulf of Mexico, with descriptions of new genera and new species. *Ibid.*, 43, no. 1936: 369-379, 8 figs. (Caprellidae, pp. 378-379.)
- RAJ, B. SUNDARA.—*Vide* SUNDARA RAJ, B.
- REED, C. T. 1941. *Marine Life in Texas Waters*. Anson Jones Press, Houston, Texas (for the Texas Academy of Sciences), xii + [2] + 88 pp., 25 illus. (Caprellidae, p. 43.)
- SAY, T. 1818. An account of the Crustacea of the United States. [Continued]. *J. Acad. Nat. Sci. Phila.*, 1(2): 374-401. (*Caprella geometrica* and *C. equilibra*, pp. 390-392.)
- SCHELLENBERG, A. 1928. Report on the Amphipoda. (In Zoological Results of the Cambridge Expedition to the Suez Canal, 1924.) *Trans. Zool. Soc. London*, 22(5): 633-692, figs. 198-209. (*Paracaprella pusilla*, pp. 677-678.)
- SMITH, S. I. 1880. On the amphipodous genera, *Cerapus*, *Unciola*, and *Lepidaetylis*, described by Thomas Say. *Trans. Conn. Acad. Sci.*, 4(7): 268-284, pl. IIa. ("Peraeon" [sic], p. 269; "peraeopod" [sic], p. 271.)
- SNODGRASS, R. E. 1952. *A Textbook of Arthropod Anatomy*. Comstock Publishing Associates, Ithaca, New York, viii + 362 pp., 88 figs. (Peracaridan coxopodite and basipodite, p. 185.)
- SPENCE BATE, C. 1856. On the British Edriophthalma. *Rept. 25th Meeting Brit. Assoc. Advanc. Sci.* (Sept., 1855), 18-62, pls. XII-XXII. ("Pereion", p. 27; "pereipoda" [sic], p. 35.)
- 1857. A synopsis of the British edriophthalmous Crustacea. Part I. Amphipoda. *Ann. Mag. Nat. Hist.*, ser. 2, 19, no. 110: 135-152, [2] figs. ("Pereiopoda" [sic], p. 140.)
- 1859. On some British Diastylidae. *Ibid.*, ser. 3, 3, no. 16: 273-274. ("Pereiopod" [sic], p. 274.)
- and J. O. WESTWOOD. 1861. *A History of the British Sessile-eyed Crustacea*. J. Van Voorst, London. Part 1, pp. 1-48. ("Pereiopodos" [sic], p. 3.)
- STEBBING, T. R. R. 1888. Report on the Amphipoda collected by H. M. S. Challenger 1873-1876. *Report Sci. Results Voyage Challenger 1873-76, Zoology*, 29(1): i-xxiv, 1-872; (2): 873-1737; (3): i-xiii, pl. I-CCX. (*Protellopsis* and *P. kergueleni*, pp. 1240-1244, pl. CXLII; *Caprella equilibra*, pp. 1254-1256.)
- 1895. Two new amphipods from the West Indies. *Ann. Mag. Nat. Hist.*, ser. 6, 15, no. 89: 397-403, pls. XIV, XV. (*Deutella* pp. 399-400; *D. mayeri*, pp. 400-402, 403; pl. XV.A.)
- SUNDARA RAJ, B. 1927. Suborder Caprellidea (Laemodipoda). (In The Littoral Fauna of Krusadai Island in the Gulf of Manaar . . .) *Bull. Madras Gov't Mus. N. S., Nat. Hist. Sect.*, 1(1): 125-128, pl. XV-XVIII.
- WHITTEN, H. L., H. F. ROSENE, and J. W. HEDGPETH 1950. The invertebrate fauna of Texas coast jetties; a preliminary survey. *Publ. Inst. Marine Sci. Univ. Texas*, 1(2): 53-87, 1 pl., 4 figs. (Includes appendix by J. W. Hedgpeth, pp. 72-85—Caprellidae, pp. 77-78.)

ABSTRACT

Descriptions are given for eight, and illustrations for seven, species of skeleton shrimps from various parts of the Gulf of Mexico. *Deutella abracadabra*, sp. nov., is described and one new species of *Caprella* is described but unnamed because of inadequate material. Two species, *Caprella equilibra* Say, 1818, and *Deutella californica* Mayer, 1890, are new records for the Gulf. *Hemiaegina minuta* Mayer, 1890, and *Paracaprella pusilla* Mayer, 1890, are believed to have been collected in the Gulf previously, but were not recorded from there by name. *Protellopsis stebbingii* [sic] Pearse, 1908, originally reported under that name from the Gulf, is synonymized with *Deutella incerta* (Mayer, 1903), which was described by Mayer as *Luconacia incerta*. The genus *Luconacia* Mayer, 1903, is treated as a synonym of *Deutella* Mayer, 1890. *Hemiaegina quadripunctata* Sundara Raj, 1927, originally described from India, is suppressed as a synonym of *Hemiaegina minuta* Mayer, 1890.