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NOAA Technical Report NMFS Circular 399

Marine Flora and Fauna of the Northeastern United States. Copepoda: Harpacticoida

Bruce C. Coull

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U.S. DEPARTMENT OF COMMERCE
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U.S. DEPARTMENT OF COMMERCE
Juanita M. Kreps, Secretary

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National Marine Fisheries Service
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FOREWORD

This issue of the "Circulars" is part of a subseries entitled "Marine Flora and Fauna of the Northeastern United States." This subseries will consist of original, illustrated, modern manuals on the identification, classification, and general biology of the estuarine and coastal marine plants and animals of the northeastern United States. Manuals will be published at irregular intervals on as many taxa of the region as there are specialists available to collaborate in their preparation.

The manuals are an outgrowth of the widely used "Keys to Marine Invertebrates of the Woods Hole Region," edited by R. I. Smith, published in 1964, and produced under the auspices of the Systematics-Ecology Program, Marine Biological Laboratory, Woods Hole, Mass. Instead of revising the "Woods Hole Keys," the staff of the Systematics-Ecology Program decided to expand the geographic coverage and bathymetric range and produce the keys in an entirely new set of expanded publications.

The "Marine Flora and Fauna of the Northeastern United States" is being prepared in collaboration with systematic specialists in the United States and abroad. Each manual will be based primarily on recent and ongoing revisionary systematic research and a fresh examination of the plants and animals. Each major taxon, treated in a separate manual, will include an introduction, illustrated glossary, uniform originally illustrated keys, annotated check list with information when available on distribution, habitat, life history, and related biology, references to the major literature of the group, and a systematic index.

These manuals are intended for use by biology students, biologists, biological oceanographers, informed laymen, and others wishing to identify coastal organisms for this region. In many instances the manuals will serve as a guide to additional information about the species or the group.

Geographic coverage of the "Marine Flora and Fauna of the Northeastern United States" is planned to include organisms from the headwaters of estuaries seaward to approximately the 200-m depth on the continental shelf from Maine to Virginia, but may vary somewhat with each major taxon and the interests of collaborators. Whenever possible representative specimens dealt with in the manuals will be deposited in the reference collections of major museums.

After a sufficient number of manuals of related taxonomic groups have been published, the manuals will be revised, grouped, and issued as special volumes. These volumes will thus consist of compilations of individual manuals within phyla such as the Coelenterata, Arthropoda, and Mollusca, or of groups of phyla.

CONTENTS

Marine Flora and Fauna of the Northeastern United States. Copepoda: Harpacticoida[1]

BRUCE C. COULL[2]

ABSTRACT

This manual contains an introduction to the general biology, an illustrated key, an annotated systematic list, a selected bibliography, and an index of the 72 genera and 121 species of marine harpacticoid copepods reported from New Jersey to Maine. The key facilitates identification to genus, whereas the annotated systematic list discusses each known species.

INTRODUCTION

Harpacticoid copepods appear to be ubiquitous in the marine environment, occurring from tide pools to the abyssal zone. The suborder Harpacticoida contains approximately 1,500 species of which about 85% are marine. Despite their abundance in the world's oceans, the harpacticoid fauna of the northeastern United States is poorly known. Only one major work (Wilson 1932) deals with the northeastern fauna as a whole. The remainder of the species are reported in theses and short papers. The 72 genera and 121 species here reported are from the northeast and the keys that follow include those genera reported in the literature as occurring between New Jersey and Maine.

Definition and Diagnostic Characters

Harpacticoida, one of seven orders of the subclass Copepoda, contains small copepods ranging in size from 0.2 to 2.5 mm. Of these seven orders three (Calanoida, Cyclopoida, and Harpacticoida) are primarily free living, although many Cyclopoida are associated to varying degrees with marine invertebrates. The other four orders, all symbionts of one sort or another, include the Notodelphyoida, commensals in tunicates; the Monstrilloida, which are parasitic in polychaetes as larvae and lack mouthparts and a functional gut in the planktonic adult stage; and the Caligoida and Lernaeopodoida, fish ectocommensals or ectoparasites with highly modified bodies.

Following Gooding's (1957) terminology the copepod body is divided into two major regions as delineated by its narrowest constriction, i.e., the anterior prosome in front of the constriction and the posterior urosome behind the constriction. In most of these, the anterior prosome is further divided into a cephalosome with all the head appendages and the first thoracic appendages (the maxillipeds), and the "metasome," including somites with legs 1-4 (or 5 in calanoids). Cephalothorax is used to define the cephalosome and any fused swimming legs [e.g., in most harpacticoids the first leg (P_1) somite is fused to the cephalosome]. Thus the fused cephalosome and P_1 somite represent the cephalothorax. The "urosome" is then the remaining posterior somites and the animal terminates with the caudal rami. The harpacticoids may be distinguished from the calanoids and cyclopoids by: 1) the position of the prosome-urosome articulation (between the fifth and sixth postcephalosome segments in the harpacticoids and cyclopoids, but between the sixth and seventh postcephalosome somites in the calanoids); 2) antennule, A_1, length: generally >22 segments (usually half the length of the body) in the calanoids, generally between 10 and 22 segments (not reaching to the end of prosome) in cyclopoids although some have fewer segments, and very short and <10 segments in the harpacticoids; and 3) structure of the antennae, A_2, (biramous in the calanoids and harpacticoids and uniramous, i.e., lacking an exopod, in the cyclopoids). See Kaestner (1969, Chapter 7) for an overview of the Copepoda.

The urosome in harpacticoids starts with the somite that bears the fifth legs. The last urosomal somite, on which the anus opens, has a pair of setose projections, the caudal rami, which bear caudal setae. The generalized harpacticoid is linear in shape with the prosome slightly wider than the urosome and the entire body gradually tapering posteriorly. There is, however, a wide variety of body shapes and forms ranging from slender, elongate vermiform organisms to oval, dorsoventrally flattened ones. Nine general body shapes are defined in Figure 1 (see legend). They represent most, but by no means all, the body shapes exploited by the harpacticoids. In the key that follows, each genus is defined as to general body shape, which should help the reader visualize the gross morphology of the animal.

I caution the reader and user of the key not to use body shape as the only criterion for distinguishing the genera. The body forms in Figure 1 are given as generalizations and four or more families may have the same body form which, then, might include some 40 or more genera. For example, the body form "fusiform prehensile" is found in

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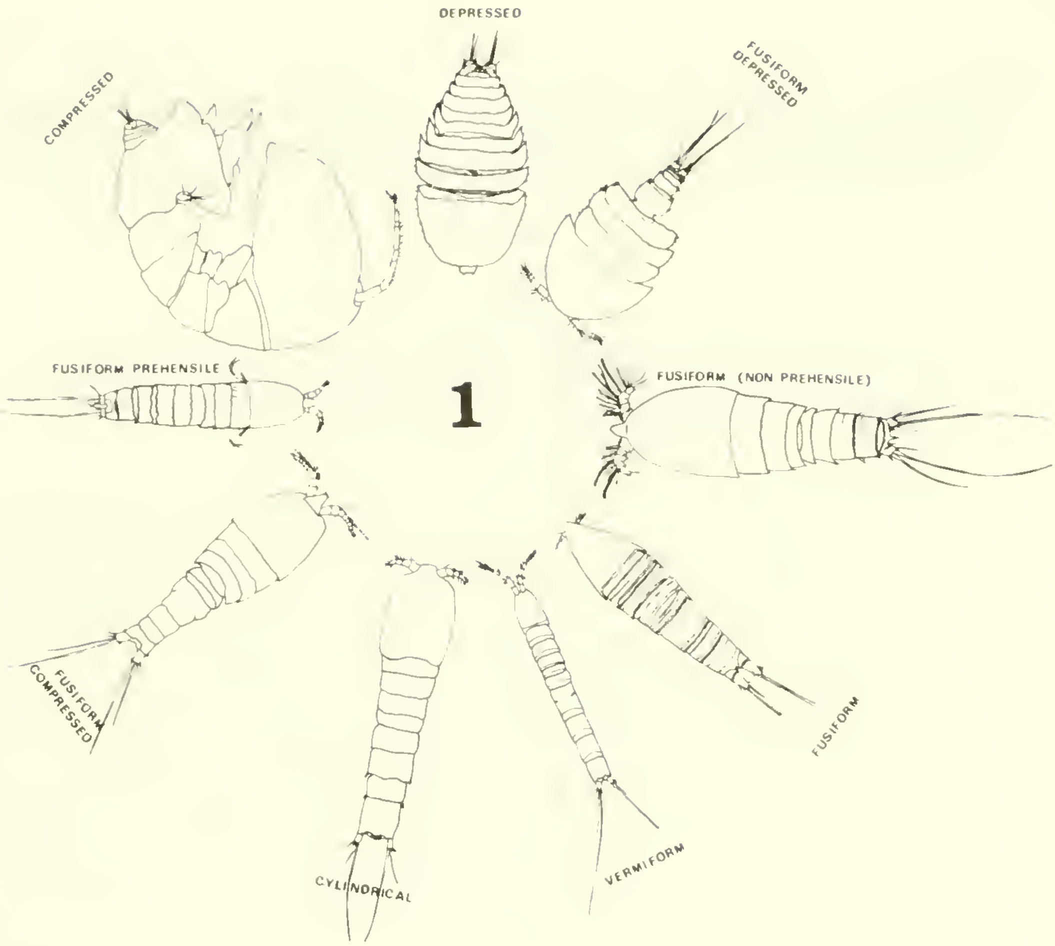


Figure 1.—Various harpacticoid copepods to illustrate the extreme diversity in body shape. All variations of harpacticoid body shape are not illustrated, only the most common. In the key that follows, a body form designation (e.g. fusiform depressed) follows each keyed out genus. Definitions of the body forms are as follows: *Vermiform*—narrow, wormlike; *Cylindrical*—almost linear, squared off cephalothorax, nonarticulated rostrum; *fusiform compressed*—broadened in prosome, narrow in urosome, thoracic somites compressed together from anterior to posterior; *fusiform prehensile*—just slightly broader in cephalon than thorax, almost linear in shape with prehensile (grasping) first leg; *compressed*—compressed laterally like amphipods; *depressed*—dorsoventrally flattened, very little tapering anterior to posterior; *fusiform depressed*—dorsoventrally flattened; *fusiform* (*nonprehensile*)—just slightly broader in cephalon than thorax; almost linear in shape, first leg not prehensile; *fusiform*—torpedo-shaped, cephalon narrowing to broad point anteriorly, anterior of metasome wider than cephalon and/or urosome (restricted to the family Ectinosomidae).

the Harpacticidae, the Thalestridae, the Diosaccidae, the Ameiridae, the Canthocamptidae, and the Laophontidae, and not all of the genera in these families conform to this body form. The sketches in Figure 1 are given as generalizations and imply no more than that.

There are usually significant morphological differences between males and females of the same species. Besides the male always being smaller than the female, the most significant and consistent difference is in the structure of the first two urosomal somites. In females these two somites are coalesced into a double genital somite. In some species the female genital somite(s) has a dorsal suture, but this suture is never present ventrally. In males these two segments are always distinctly separated. Most males also have a geniculate antennule (A_1) with a swollen segment about midlength. This modified (from the female condition) antennule is used as a grasping appendage during copulation. In most cases the fifth leg is also sexually dimorphic. When it is dimorphic, it is always smaller in the male than the female and it may differ structurally as well. Additionally, males usually have a minute pair of sixth legs on the second urosomal somite, which project laterally and distally as small setiferous knoblike lobes. The females lack the sixth legs. Other body parts may also be sexually dimorphic, e.g., the rostrum, some of the mouthparts, legs 1-4, and the caudal rami, but there is no general rule as to where the morphological changes will be. One example of swimming leg dimorphism is shown in Figure 8.

Many times males of a species are rare and most of the taxonomically important features are based on female morphology. Additionally, there are some genera that cannot be identified using only one sex. For example, females of *Amonardia*, *Amphiascopsis*, and *Metamphiascopsis* are indistinguishable and generic separation is based entirely on male dimorphic characters, while in other genera the males are indistinguishable and separation is based entirely on female morphology. In the key I have tried to use characters common to both sexes; however, such characters are often not very useful and in some cases I have had to use either a male or female character to specifically designate a genus.

The harpacticoid body surface is often ornamented with minute sensilla, fine hairlike filaments projecting outward through the cuticle. These structures are often found banding the animal and have important taxonomic significance in intrageneric systematics but will not be discussed in detail here.

The cephalon (head) bears five pairs of appendages (standard abbreviations in parentheses after the appendage name): antennules (A_1), antennae (A_2), mandibles (Md), maxillulae (or 1st maxillae, Mxl), and maxillae (or 2nd maxillae, Mx). Projecting forward from the anterior end of the cephalosome between the A_1's is usually a rostrum. The rostrum varies in size from as long as the first three A_1 segments to minute and barely visible. The rostrum may have a distinct articulation with the cephalon (i.e., defined at the base) or it may be fused to the cephalon with no articulation and therefore not defined at its base. The first two thoracic somites, which are usually fused to the cephalon (forming the above defined cephalosome), also bear appendages, i.e., the maxillipeds (Mxp) and the first legs (P_1). The remaining thoracic somites bear legs 2-4 (P_2-P_4). The urosome starts with the somite bearing the 5th legs (P_5) and extends to the caudal rami (see Figure 2 for generalized harpacticoid with appendages).

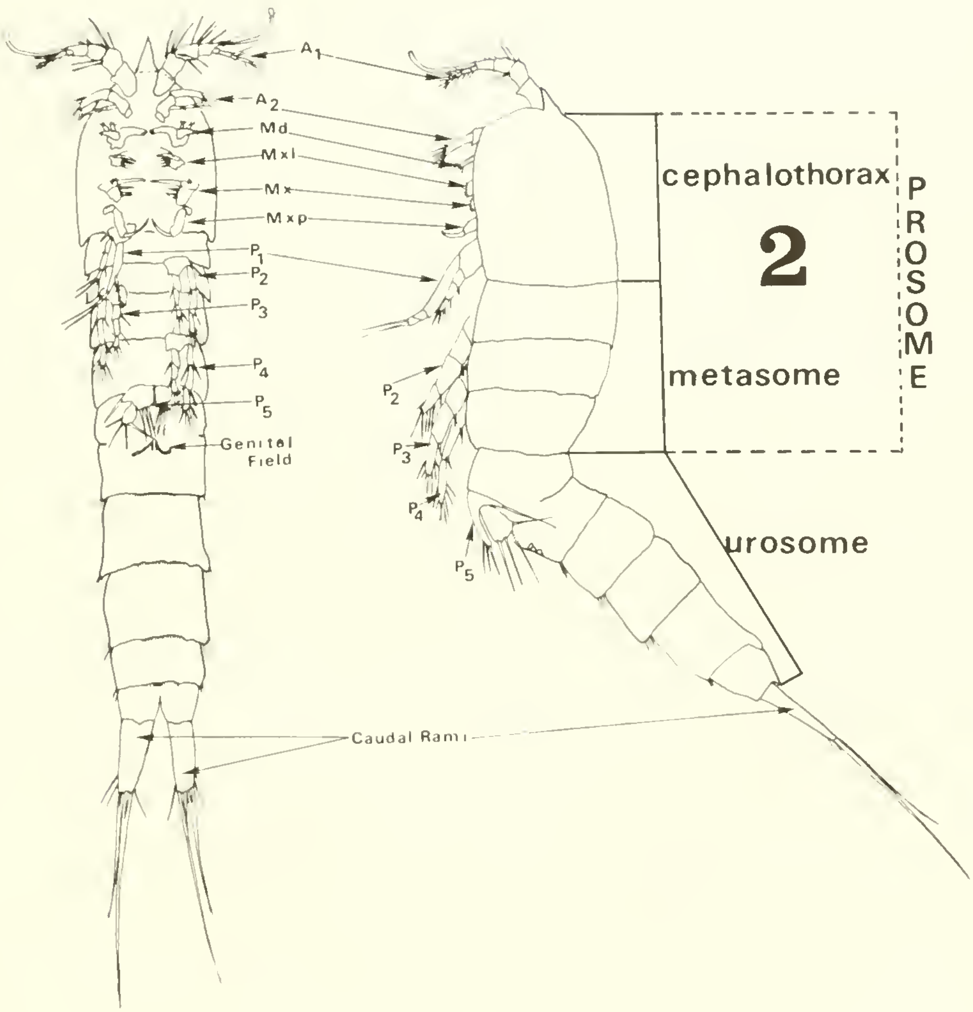
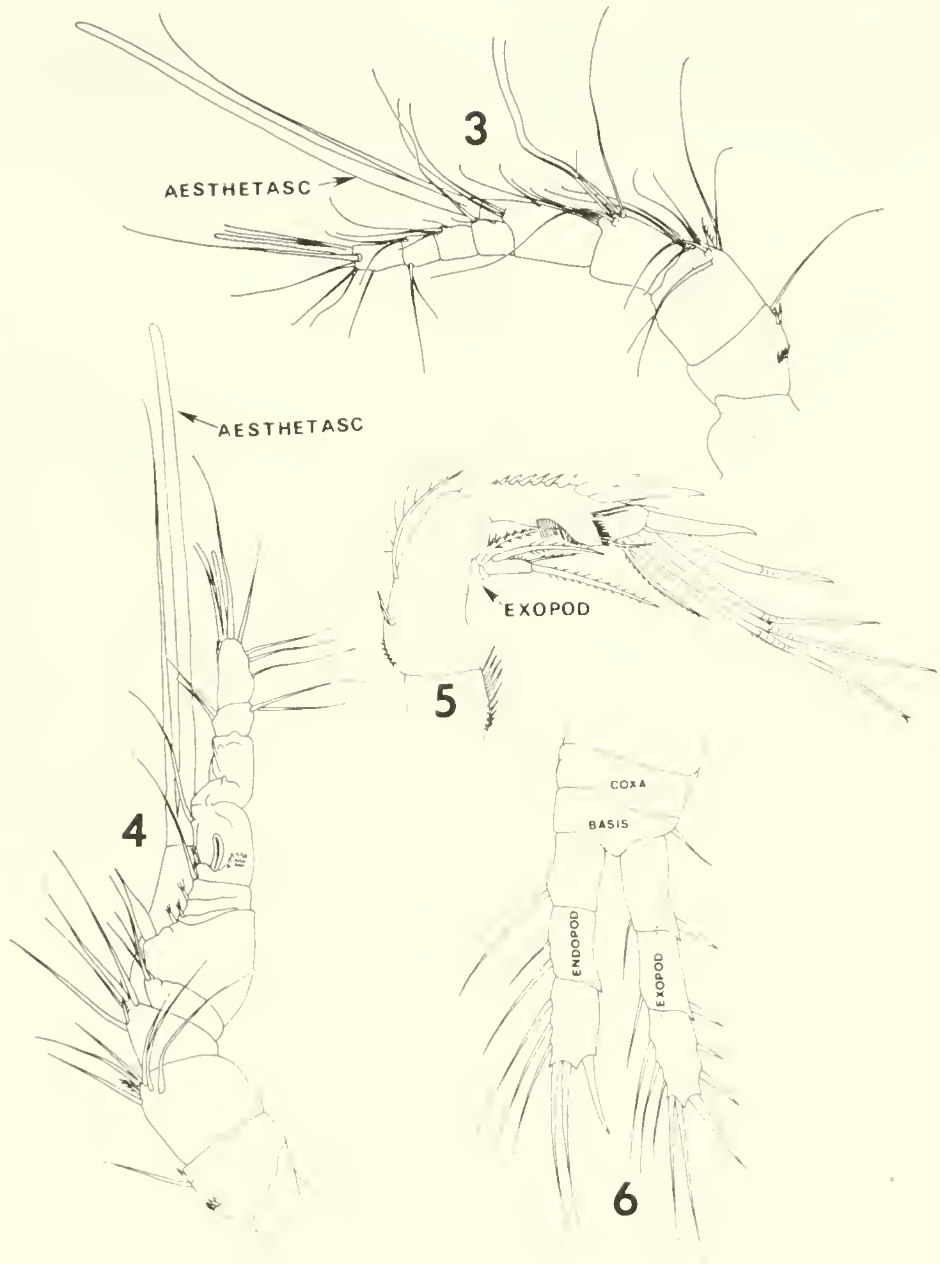


Figure 2.—Ventral and lateral views of a generalized harpacticoid copepod with body parts labeled. A_1 = antennule; A_2 = antennae; Md = mandible; Mxl = maxillula; Mx = maxilla; Mxp = maxilliped; P_1-P_5 = legs 1-5. In the ventral view only one pair of legs is drawn per somite. Each somite, of course, has a pair of legs, but for the sake of clarity only alternative sides are drawn.

The antennules (A_1) in harpacticoids are short (4-10 segments) and usually bear 1 or 2 aesthetascs (transparent, setalike organs) somewhere on the appendage (Fig. 3). The male A_1's are usually swollen and hooklike and are used as grasping appendages (Fig. 4).

The antennae (A_2) are biramous and each consists of a basis, an endopod, and a small (1- to 6-segmented) exopod (Fig. 5). Two terms necessary for understanding the structure of the A_2 must be introduced since they appear in the key which follows, i.e., *basis* and *allobasis*. An A_2 with an *allobasis* is one in which the exopod originates on the first endopod segment (Figs. 5 and 70). An A_2 with a *basis* is one in which the exopod originates from the *basis*, and not the first endopod segment (Fig. 69). An *allobasis* A_2 often appears as having but 2 segments, whereas the *basis* A_2 appears as 3-segmented.

The mandibles, maxillulae, maxillae, and maxillipeds are complex and specialized feeding structures which, although furnishing extremely useful specific characters, necessitate descriptions and explanations beyond the



Figures 3-6.—Enlargment of some harpacticoid body parts: 3) female antennule (A_1); 4) male antennule (A_1), note modification as grasping organ; 5) generalized antenna (A_2); 6) generalized harpacticoid leg with parts labeled. The leg figured has a 3-segmented exopod and a 3-segmented endopod, but either ramus may have 1, 2, or 3 segments, depending on the species.

scope of this work. Unfortunately, it is necessary to use some of the mouthparts in the following key (e.g., see couplets 6, 29, 31, and 47) and for the purposes of using the key the following brief discussion should suffice. First, the user of the key must make sure to observe the proper mouthpart. Figure 7 illustrates their in situ location on the ventral side of the cephalosome. In order from anterior to posterior one encounters the mandibles (Md), the maxillulae (Mxl), the maxillae (Mx), and the maxillipeds (Mxp). The complete mandible consists of a praecoxa (with a toothed cutting edge), a coxa-basis, an endopod, and an exopod (Fig. 7). The complete maxilla consists of a syncoxa with endites, a basis, and an endopod (Fig. 7), and the complete maxilliped consists of a coxa, a basis, and an endopod (Fig. 7). Each mouthpart theoretically consists of all the above listed parts (and thus the word "complete" prefaces each description). However, in any given species various parts may be reduced or absent, e.g., couplet 29 of the key (Fig. 46) refers to a maxilliped without a coxa and without an en-

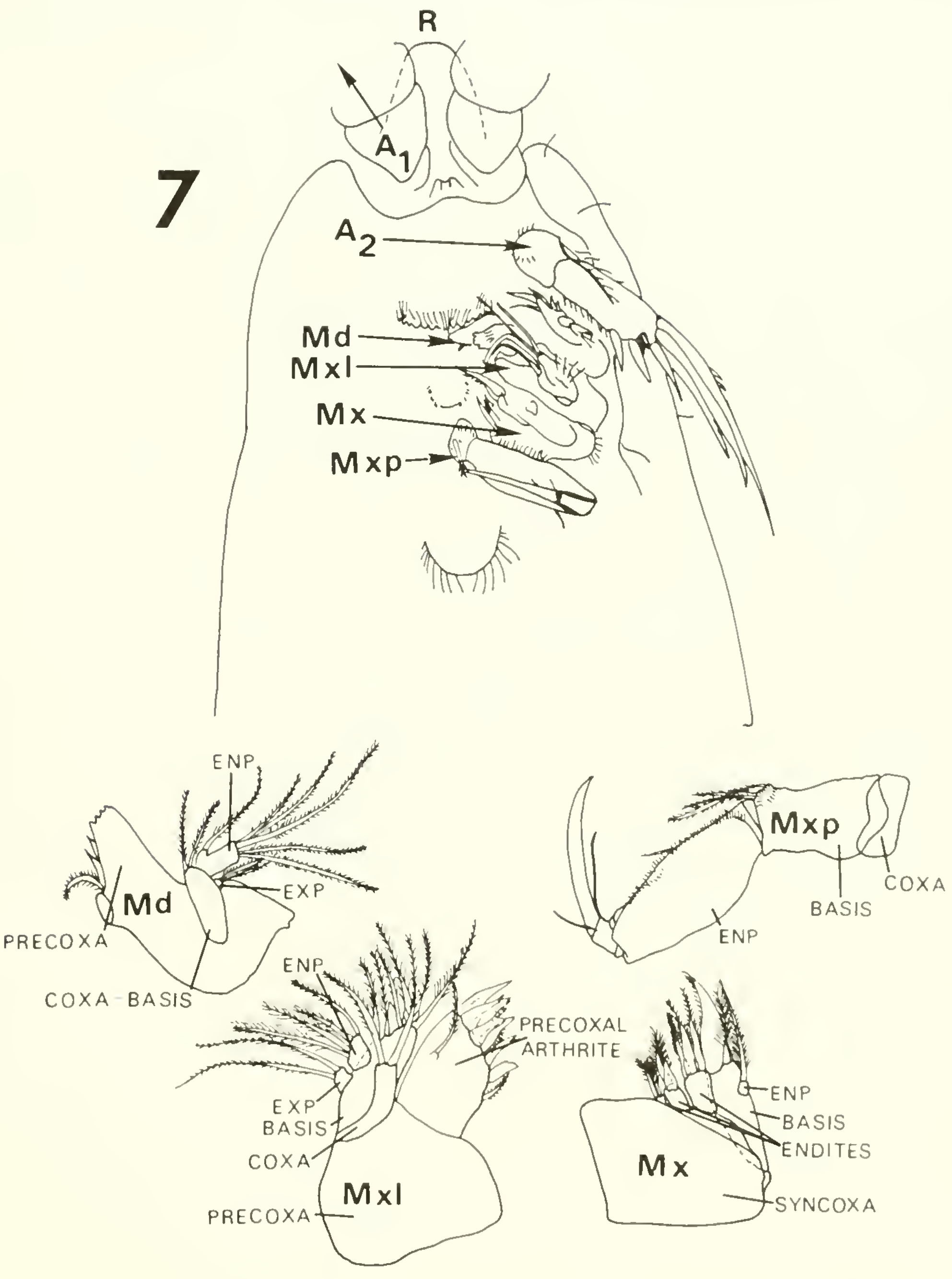


Figure 7.—Upper portion illustrating ventral view of cephalosome with positioning of the appendages, i.e., rostrum (R), antennule (A), antennae (A), mandible (Md), maxillula (Mxl), maxilla (Mx), and maxilliped (Mxp). Lower portion showing enlargement of the various mouthparts, illustrating details.

dopod. The portions most often lacking on the various mouthparts are the endopods and the exopods but there is no generalization that can be made as to when or in what genera these parts will be lacking or reduced. For a more complete morphological description and differentiation of these parts, the reader should see Lang (1948, 1965).

Legs 1-5 (P_1-P_5) are the most widely used appendages for taxonomy. Legs 1-4 are generally constructed in a similar manner, whereas leg 5 is usually fused and morphologically dissimilar from the others. Therefore, P_5 will be dealt with separately. P_1-P_4 are generally constructed with a coxa, a basis, an outer exopod (Exp), and an inner endopod (Enp) (Fig. 6). The coxa attaches to the ventral side of the body on either side of the midline with the basis attaching to it. The exopod and endopod vary in length, the number of segments and setation depending on the species. The example in Figure 6 illustrates 3-segmented rami, which is probably the most advanced condition of the order. In many species, the endopod of P_1 is modified as a prehensile appendage where segment 1 is usually much longer than segments 2 and 3 combined and segment 3 generally terminates with one or two recurved setae reminiscent of a claw. Functionally this appendage is most likely used for grasping and clinging to substrates and is most highly developed in the phytal forms. In the benthic forms it is probably used to grasp and turn over sediment particles and perhaps to hold the particles while scraping them with the mouthparts. Besides changes in leg segmentation, the P_2 and/or P_3 endopod is usually different in the male than it is in the female. The male endopod may be one segment shorter than the female's and terminally modified into either a spatulate, spear, or clawlike process. Figure 8 illustrates one such dimorphic modification.

All five pairs of legs may be ornamented with complements of setae, spines, hairs, spinules, setules, knobs, denticles, ridges, and other chitinous protusions. The terms "spine" and "setae" are used for short stiff processes and for long flexible processes respectively, and are the most important leg armature characters for identification of the animal. Setae and spines are noted in the diagram of the typical harpacticoid leg (Fig. 6). Most harpacticoid taxonomists use a system of numbers to depict the spine and setal arrangement known as the setal formula. This is arrived at by counting the number of inner (medial) setae and spines of each segment of each ramus up to the last segment and then counting all the setae and spines on the last segment of the ramus. For example, if we were to arrive at a setal formula for the typical harpacticoid leg in Figure 6, we would count the inner setae on the first endopod segment (1); the inner setae on the second endopod segment (2); the inner setae on the third endopod segment (3); the terminal setae on the third endopod segment (2); and the outer (lateral) setae on the third endopod segment (1). For the exopod we would count the inner setae on segment one (1); the inner setae on segment two (1); the inner setae on

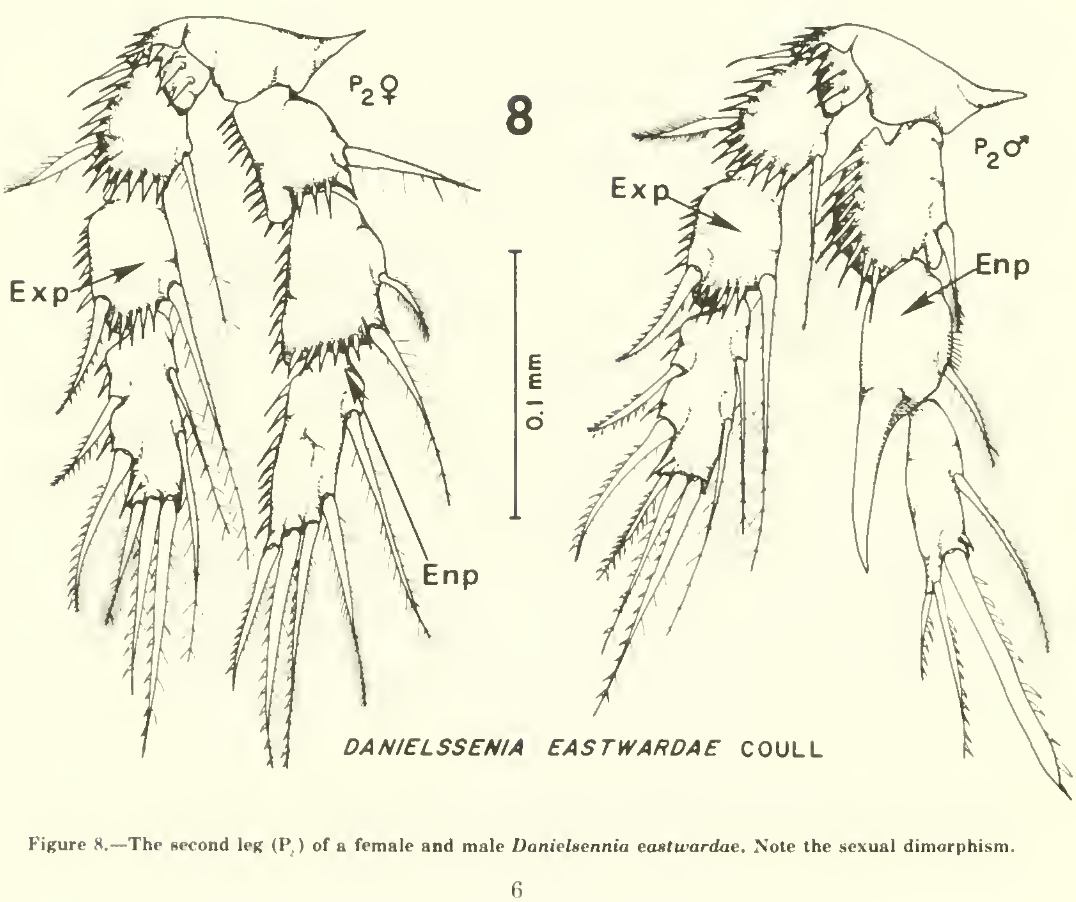


Figure 8.—The second leg (P_2) of a female and male *Danielsennia eastwardae*. Note the sexual dimorphism.

segment three (3); the terminal setae on segment three (2); and the outer setae on segment three (3). Therefore, our setal formula would be:

Enp.	Exp.
1.2.321	1.1.323

When this is done for legs 1-4 and presented in tabular form, it is a very quick way to compare these important taxonomic characters.

P_5 is dimorphic and varies so widely that generalization about it is difficult. However, in most cases the coxa-basis and endopod are fused into a nonsegmented platelike structure called the baseoendopod (Benp) to which the nonsegmented plate or leaflike exopod (Exp) is attached (there are a few genera in which the P_5 exopod is segmented). Often however, the left and right baseoendopods are fused together forming a continuous plate across the entire ventral side of the body. The male appendage is constructed similarly to that of the female but is always much smaller and less ornate. The female P_5 legs are often used as a broad pouch or as protecting flaps for the developing externally attached eggs (Fig. 9).

The caudal rami, often misnamed the furcae (see Bowman 1971), are articulated to the last urosomal somite and have at least one major seta (usually two setae) projecting posteriorly. The caudal rami are usually the same in both sexes, but there are several genera which may have dimorphic caudal rami (e.g., *Phyllopodopsyllus, Enhydrosoma*).

Ecology

As in many other marine groups, the greatest number of harpacticoids live in shallow-water sediments and/or in the phytal zone. In the benthos harpacticoids are second only to nematodes in overall abundance and in some areas are often the most abundant taxon found in the meiobenthos. Harpacticoids usually follow one of three modes of existence in the sediment: 1) interstitial, 2) burrowing, or 3) epipelic (surface living) (see Fig. 1 for various body shapes). The interstitial harpacticoids (e.g., Cylindropsyllidae) are typically vermiform, elongate animals that occupy the interstices of sands by wriggling around and between the sand particles. The burrowers are generally broadened at the cephalothorax (*Halectinosoma*, Diosaccidae) for pushing sediment particles out of their path or are equipped with spade-shaped appendages (*Cerviniella*, some Cletodidae) for digging in the sediments. They are most common in fine sediments with a median particle diameter below 200 μm, i.e., muds, silt-clays. The epipels are those harpacticoids that typically live on the surface of the sediment and, in many cases, are adapted morphologically to this mode of existence by the great elongation of body limbs (*Malacopsyllus, Mesocletodes*) to increase the surface to volume ratio which, since they usually occur on soft sediments (particularly in the deep sea), allows them to walk over the surface of fluidlike mud without sinking.

The phytal (or epiphytic) species are extremely common on marine algae and angiosperms, e.g., *Zostera*,

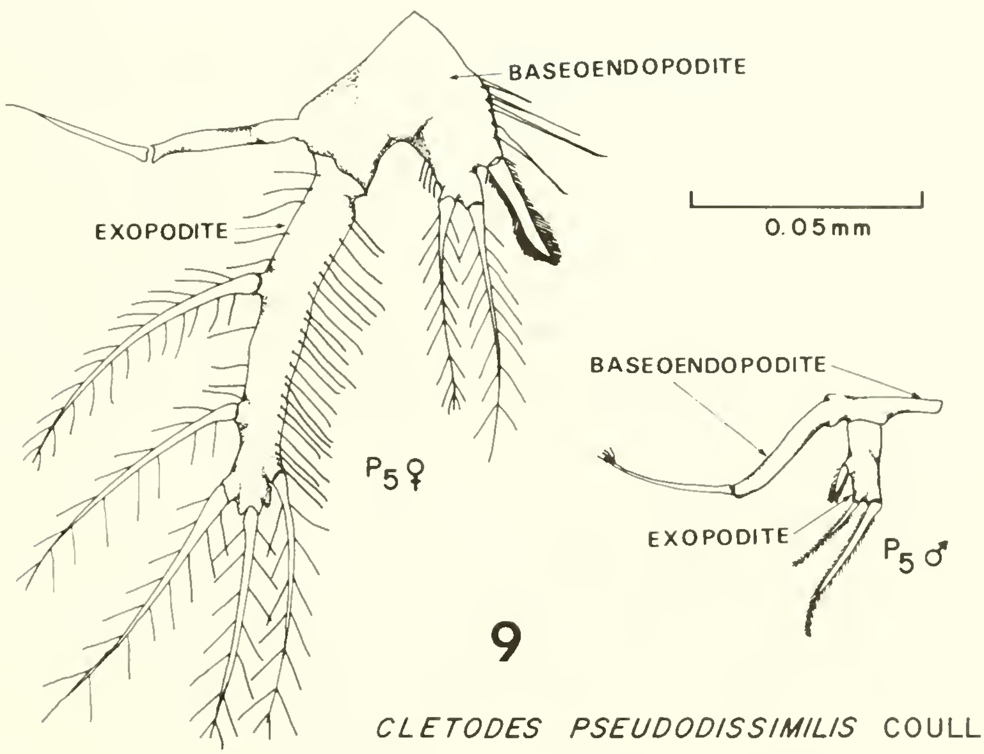


Figure 9.—The fifth leg (P) of a female and male *Cletodes pseudodissimilis*. Note the large size differentiation between the two sexes.

Fucus, Ulva, etc. Most of these forms are also adapted for a free-swimming existence and are either cyclopoid in shape (*Tisbe, Diarthrodes*), flattened, shield-shaped (*Scutellidium, Porcellidium*) or laterally compressed and amphipodlike (*Parategastes*). All of these forms probably feed on the associated microbiota of the plants and usually cling very closely to the fronds or leaves with their strongly prehensile first legs.

The truly free-swimming (euplanktonic) harpacticoids (*Miracia, Euterpina, Microsetella,* etc.) comprise a very small proportion of the order. They are among the largest harpacticoids known and have elongate setae or unique body shapes, as do many pelagic organisms, to stay afloat.

I have not exhausted the habitats nor the body forms of the harpacticoids, but suggest the interested reader see Noodt (1971) for review.

Harpacticoids are the most sensitive of the meiobenthic organisms to changes in oxygen tension and are often the first to disappear if conditions become anaerobic. Harpacticoid copepods feed primarily on diatoms, bacteria, and small protozoans. Although there are many literature reports of harpacticoids feeding on "detritus," it is now thought they are actually feeding on the microbiota on the detritus particles.

Population densities of harpacticoids are highest in shallow areas and the highest densities so far reported are from New Jersey salt marshes. The high density areas are usually represented by a limited number of species (10-20). Some harpacticoid assemblages, however, have been reported with 60-70 species. Diversity of copepod fauna increases into the deep sea, whereas density in the deep sea is two or three orders of magnitude less per unit area than in shallow water.

Collecting

Sampling technique varies depending on the habitat to be examined and entails extracting the animals from the sediment or plant materials in which they live. Intertidal meiobenthic forms can be collected by either coring or digging into the substrate, narcotizing the samples (with isotonic $MgCl_2$:73.2 g/liter) then sieving the sample through nets or wire screens less than 500 μm so that the animals will be retained. Whereas samples for most meiobenthic taxa must be narcotized, this is not absolutely essential for removal of the harpacticoids since agitation (shaking) of the sand will generally free most of the animals. Subtidally most harpacticoids occur in the upper 2-3 cm of the sediment and can be collected with grabs and corers, or by scooping up the top sediment layers.

Phytal animals are most easily collected by agitating the plant in a bucket of water (with or without narcotization) and then screening the residual water through fine meshes or by dragging a plankton net through the plant stands. The euplanktonic forms are collected, as are all zooplankters, by towing nets.

Samples can be stored in 4% buffered Formalin for long periods of time with little or no decomposition of the animals. To facilitate sorting of preserved meiobenthic samples, add a few grains of the vital stain "Rose Bengal" to the sediment-seawater before adding 4% Formalin to the mixture. The animals will stain red, while the sediment particles remained unstained, and thus the animals can be easily spotted. For permanent storage the preserved animals should be transferred to 70% ethyl alcohol.

Examination Procedure

In order to use the following key it will generally be necessary to dissect the animal and mount it on a slide. However, if many individuals are available, all the body parts necessary for identification will probably be visible if 6-10 individuals are mounted randomly on the slide and then observed.

After sorting a sample to collect all the harpacticoids the following procedure can be used, with a dissecting microscope:

1. Sort into groups of specimens all the "look-alikes" isolating each "look-alike" group into embryological staining dishes, or watch glasses, etc.
2. With the first group, put several (3 or 4) animals into a depression slide with glycerol or Hoyer's mounting media (dissolve 8 g gum arabic in 10 ml distilled water; add 75 g chloral hydrate, 5 ml glycerine, and 3 ml glacial acetic acid; strain through clear muslin or glass wool), or Reyne's mounting media (dissolve 10 g chloral hydrate in 10 ml distilled water; add 2.5 ml glycerine and mix; add 6 g gum arabic and stir very cautiously—avoid bubbles; let sit 1 wk—no filtering necessary) or undiluted lactic acid (see Humes and Gooding 1964, for this technique). Cover one-half to three-fourths of the liquid filled depression with a 22 × 22 mm coverlsip, allowing the other one-half to one-fourth to remain uncovered. Put slide on compound scope (phase contrast microscopy is extremely helpful) and by pushing the coverslip you can roll the animals over and see many of the body parts necessary without damaging them.
3. After observing the animals in the depression slide, remove the coverslip being careful not to harm them. If you deem it necessary to dissect an animal you may do so in the depression slide; if not, return it to the container.
4. Dissection: Using tungsten needles (0.005-mm diameter and sharpened by dipping into molten sodium nitrite) expoxied into 0.5-mm diameter capillary tubing, cut and separate each somite and its associated appendages from anterior to posterior one at a time. After each somite is removed mount it on a slide, then dissect and mount the next somite, etc. up to the 5th pair of legs. Retain the urosome in toto and mount this.
5. Mounting: Each copepodologist probably has his own technique, but I place all the dissected body parts from one animal on the same slide, with each

part under its own microcoverglass (12 × 12 mm). I use a one-end frosted slide and mount in small drops of Hoyer's or Reyne's mounting media (or, for less permanent mounts, lactic acid). Each 25 × 75 mm slide can take up two rows of four microcoverslips (12 × 12 mm), i.e.,

LABEL	A_1 A_2	Head	P_1	P_2	
	P_3	P_4	P_5	UR & CR	

I then have an entire dissected animal on a single slide. I usually dissect and place under separate coverslips the A_1 and A_2, remainder of head, P_1, P_2, P_3, P_4, P_5, urosome, and caudal rami. Hamond (1969) however, suggests streaking the mounting media and placing each part of the animal in the streak in the order in which they appear on the animal and using a large coverslip to cover the entire streak. Other authors have suggested mounting between two coverslips or on specially constructed slides (e.g., Humes and Gooding 1964) in order to give equal access to either side of any part, but I have not found this necessary. In Reyne's media, hardening will take place in 1 or 2 days and the slide need not be ringed; in Hoyer's hardening takes 1 or 2 wk and should be ringed for permanent mounts.

6. Each part of the animal is now available for viewing and can be drawn (using a *camera lucida*) or photographed should the investigator desire.
7. The process should then be followed for all the specimens in the collection and, of course, each slide labeled.
8. For permanent storage of whole animals 70% ethanol is recommended.

The most complete treatise on harpacticoid copepods is Karl Lang's 1948 two-volume *Monographie der Harpacticiden*, which has recently been reprinted and is now available. The monograph discusses morphology (external and internal) and lists and gives figures, keys, setal formulae, etc. for all species described up to 1948. No serious harpacticoid systematist can be without a copy of Lang's 1948 monograph. Also extremely valuable is Lang's 1965 *Copepoda Harpacticoidea from the Californian Pacific Coast* in which he updates, revises, and discusses each of the species of the genera he encountered in California. For a listing of all marine species described after Lang 1948 see Bodin (1967, 1971).

KEY TO THE GENERA OF MARINE HARPACTICOIDA OF THE NORTHEASTERN UNITED STATES

This key is necessarily incomplete because there are undoubtedly many species in the northeastern United States that as yet have not been reported. Since the purpose of the key is to acquaint the nonspecialist with the Harpacticoida and since the northeastern fauna is poorly known, the key is only to genus. If the key were to species it might lead a user to misidentify an unreported species as one listed in the key. Thus, by providing keys only to genus, unnecessary taxonomic-nomenclatural problems can be avoided. Furthermore, in some genera it is almost impossible to separate the species morphologically without detailed analyses of specific body parts. This type of taxonomic separation is beyond the scope of this manual and should be left to the specialist.

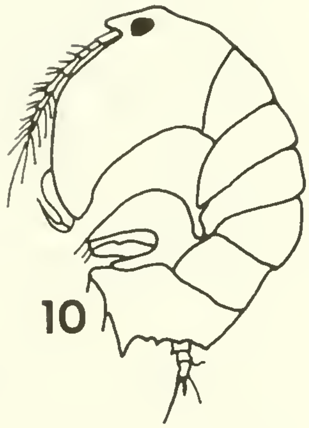
All species recorded from the northeast are listed in the annotated systematic list that follows the key, and it should be consulted for references to northeastern findings and descriptions.

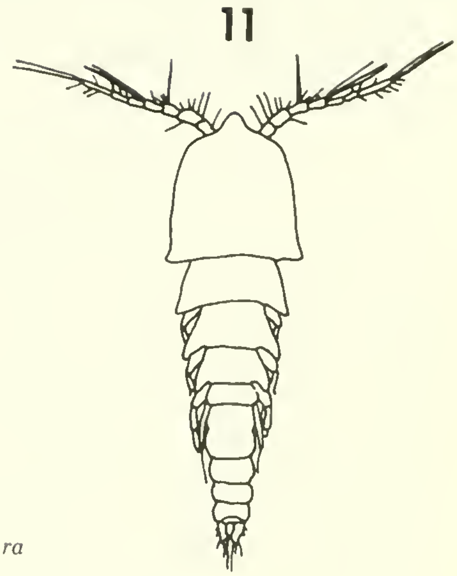
In couplets where genera are identified, the designation of general body form (see Fig. 1 and p. 2) follows the generic name. If no "body shape" follows the generic designation, the genus does not resemble one of the forms illustrated in Figure 1. In all figures of legs the exopod is always on the right, the endopod on the left.

1 Body laterally compressed or dorsoventrally compressed with square cephalic shield 2

1 Body not compressed 3

2 (*1*) Body amphipod shaped; laterally compressed (Fig. 10) . . . . *Parategastes* (compressed)



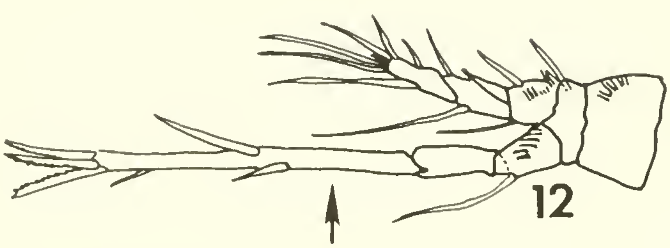


2 (*1*) Body dorsoventrally compressed; cephalic shield square with pointed rostrum (Fig. 11); pelagic . . . . *Clytemnestra*

3 (*1*) Exopod antenna (A_2) at least 6 segments 4

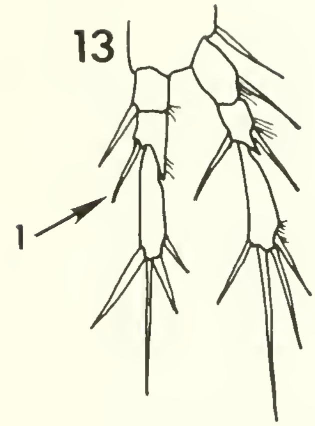
3 (*1*) Exopod antenna (A_2) at most 4 segments 6

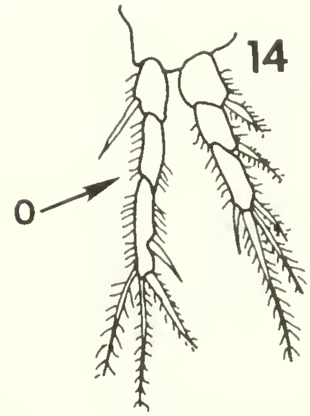
4 (*3*) Last segment endopod second leg (P_2) longer than entire exopod and usually as long as entire body (Fig. 12) . . . . *Longipedia* (fusiform nonprehensile)



4 (*3*) Last segment endopod second leg (P_2) shorter than entire exopod 5

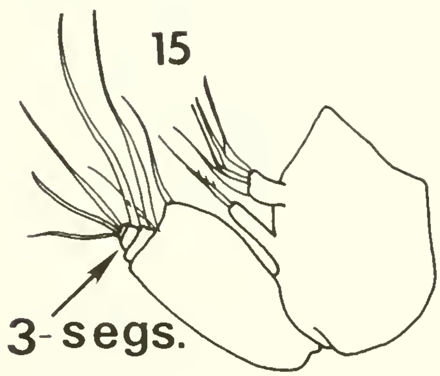
5 (4) Inner seta middle segment endopod fourth leg (P_4) present (Fig. 13) . . . *Canuella* (fusiform nonprehensile)

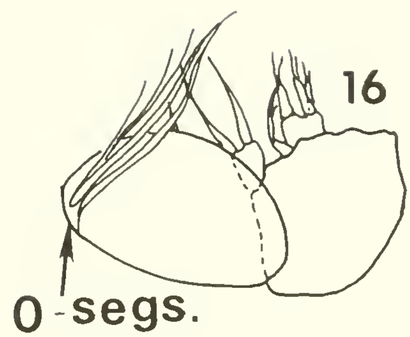




5 (4) Inner seta middle segment endopod fourth leg (P_4) absent (Fig. 14) . . . *Scottolana* (fusiform nonprehensile)

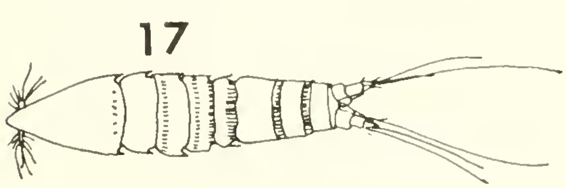
6 (3) Maxilla generally as in Figure 15 or 16; baseoendopod P_5 with only 2 setae 7

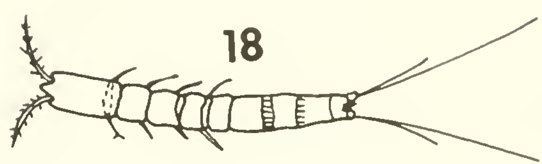




6 (3) Characters not combined as above 12

7 (6) Body fusiform, cephalothorax attenuated in front (Fig. 17) 8

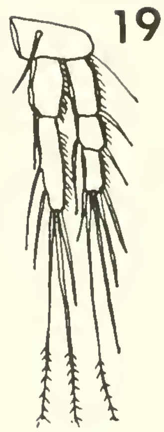




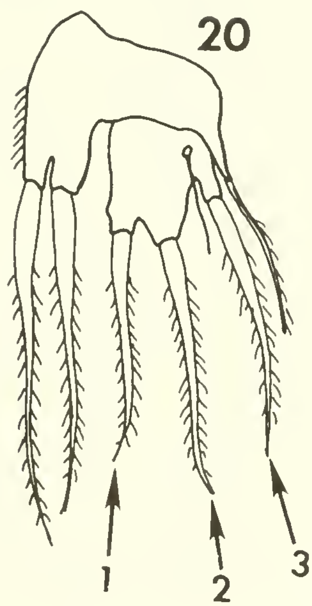
7 (6) Body vermiform, cephalothorax rectangular in front (Fig. 18); last somite with spines projecting dorsally . . . . *Arenosetella* (vermiform)

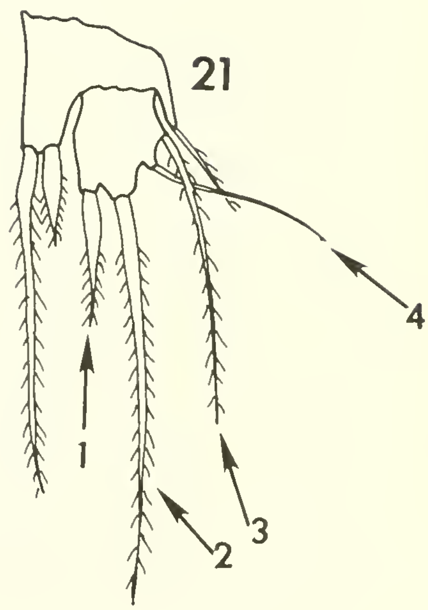
8 (7) Endopod first leg (P_1) 3-segmented 9

8 (7) Endopod first leg (P_1) 2-segmented (Fig. 19) . . . . *Sigmatidium* (fusiform)



9 (8) Exopod fifth leg (P_5) with 3 marginal setae (Fig. 20) 10

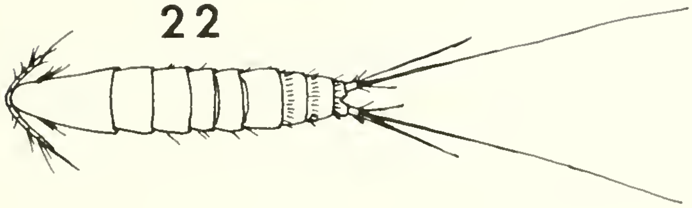




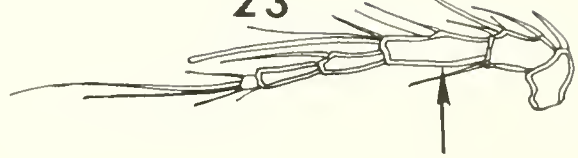
9 (8) Exopod fifth leg (P_5) with 4 marginal setae (Fig. 21) . . . .*Ectinosoma* (fusiform)

10 (*9*) Setae of caudal rami longer than entire body (Fig. 22); third segment antennule (A_1) three times as long as broad (Fig. 23); pelagic . . . . *Microsetella* (fusiform)

22



23

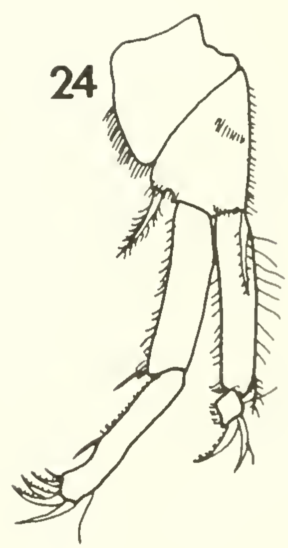


10 (*9*) Characters not combined as above 11

11 (*10*) Endopod maxilla (Mx) 3-segmented (Fig. 15) . . . . *Pseudobradya* (fusiform)

11 (*10*) Endopod maxilla (Mx) at most 1-segmented (Fig. 16) . . . . *Halectinosoma* (fusiform)

24

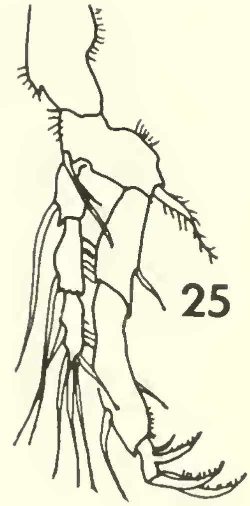


12 (*6*) First leg (P_1) as in Figure 24 16

12 (*6*) First leg (P_1) not as in Figure 24 13

13 (*12*) First leg (P_1) as in Figure 25 . . . . *Alteutha* (depressed)

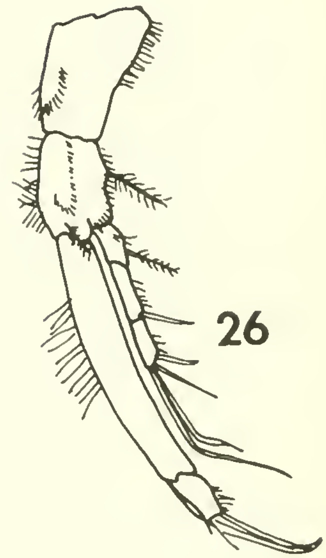
13 (*12*) First leg (P_1) not as in Figure 25 14



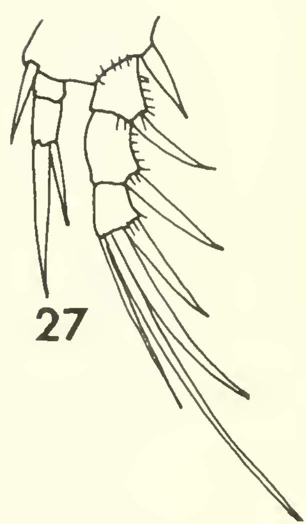
25

14 (*13*) First leg (P_1) as in Figure 26 (exopod may have 1-3 segments) 18

14 (*13*) First leg (P_1) not as in Figure 26 15



26



27

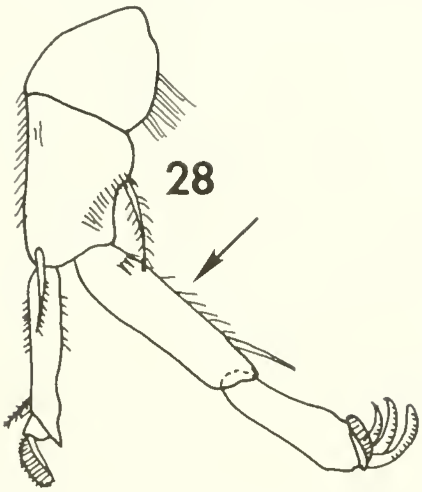
15 (*14*) First leg (P_1) as in Figure 27; body pear shaped; mouthparts degenerate . . . . *Metis* (fusiform compressed)

15 (*14*) First leg (P_1) shaped differently than those in Figures 24-27 26

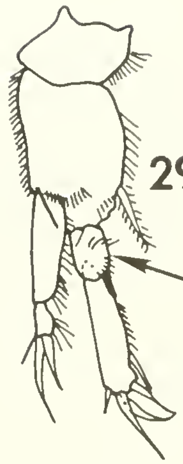
16 (*12*) Body depressed (Fig. 1) and wide 17

16 (*12*) Body normal harpacticoid shape, gradually tapering behind . . . . *Harpacticus* (fusiform prehensile)

17 (*16*) First segment exopod first leg (P_1) much longer than broad (Fig. 28) . . . . *Zaus* (depressed)



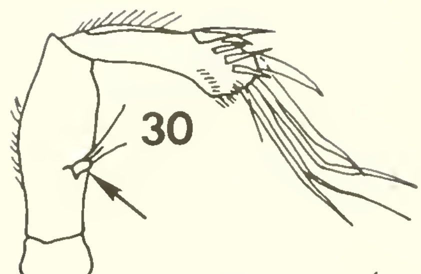
28



29

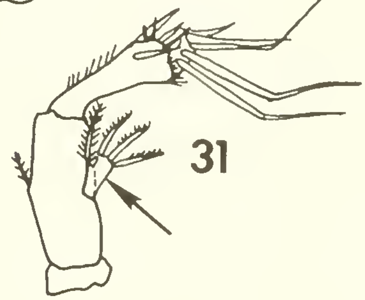
17 (*16*) First segment exopod first leg (P_1) about as long as broad (Fig. 29) . . . . *Zausodes* (depressed)

18 (*14*) Exopod antenna (A_2) one small, very reduced segment with 2, 3, or 4 tiny smooth setae (Fig. 30) 19



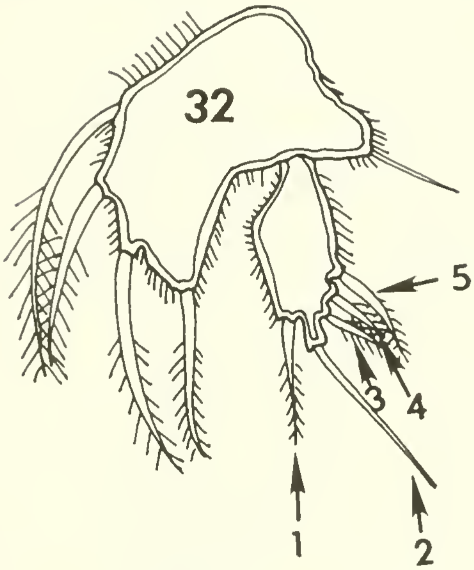
30

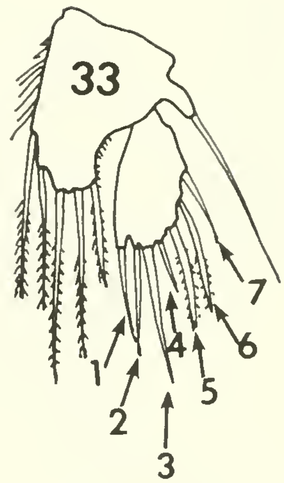
18 (*14*) Exopod antenna (A_2) one well-developed segment with 4 large (pinnate in portions) setae (Fig. 31) 20



31

19 (*18*) Exopod fifth leg (P_5) female with 4 or 5 setae (Fig. 32) . . . . *Paronychocamptus wilsoni* or *nanus* (fusiform prehensile)

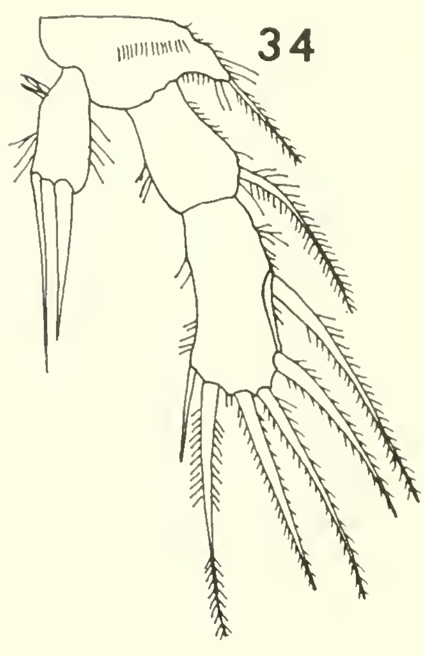




19 (*18*) Exopod fifth leg (P_5) female with 6-8 setae (Fig. 33) . . . . *Heterolaophonte* (fusiform prehensile)

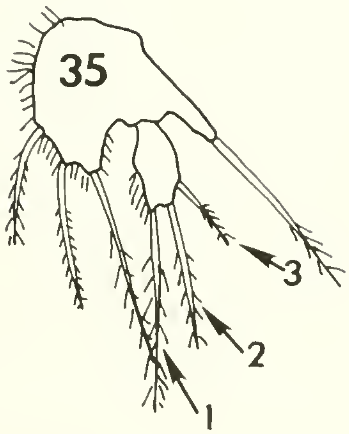
20 (*18*) Exopod fourth leg (P_4) with 3 segments 21

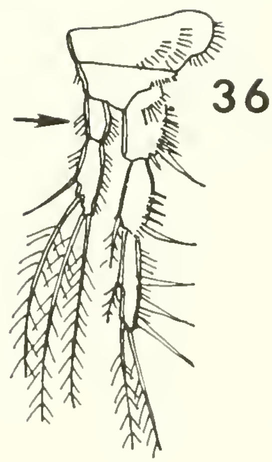
20 (*18*) Exopod fourth leg (P_4) with 2 segments (Fig. 34) . . . . *Harrietella* (fusiform prehensile)



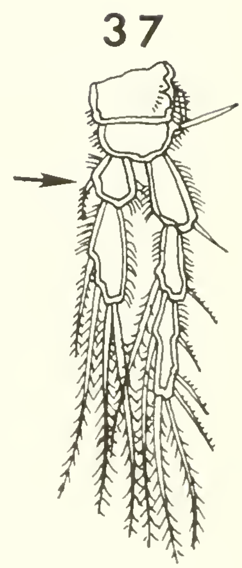
21 (*20*) Exopod fifth leg (P_5) with 4 or more setae 22

21 (*20*) Exopod fifth leg (P_5) with at most 3 setae (Fig. 35) . . . . *Onychocamptus* (fusiform prehensile)

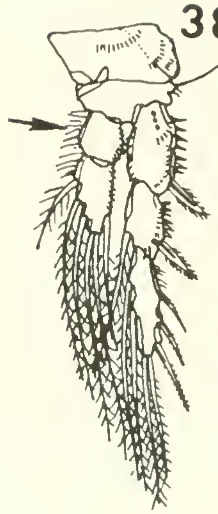




22 (*21*) First segment endopod second leg (P_2) without an inner seta (Fig. 36) 23

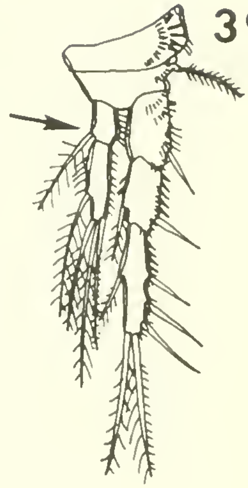


22 (*21*) First segment endopod second leg (P_2) with an inner seta (Fig. 37) . . . . *Laophonte cornuta* (fusiform prehensile)



38

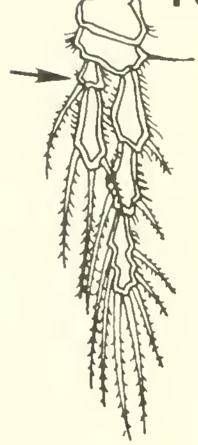
23 (22) First segment endopod third leg (P_3) without an inner seta (Fig. 38) 24



39

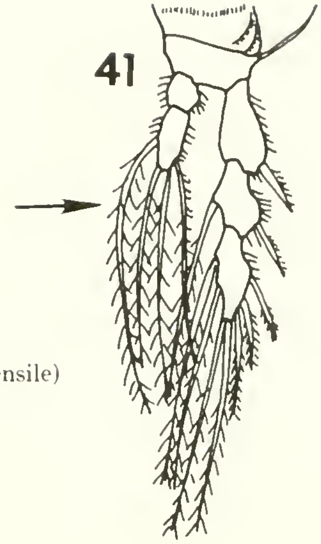
23 (22) First segment endopod third leg (P_3) with an inner seta (Fig. 39) . . . . *Pseudonychocamptus* (fusiform prehensile)

24 (23) First segment endopod fourth leg (P_4) without an inner seta (see Figs. 41, 42) 25



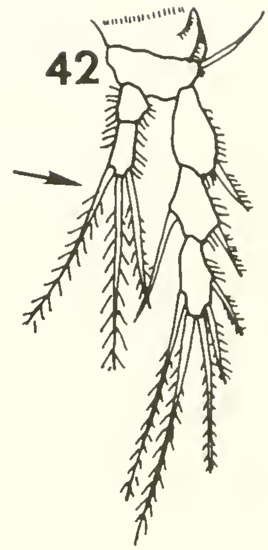
40

24 (23) First segment endopod fourth leg (P_4) with an inner seta (Fig. 40) . . . . *Laophonte longicaudata* (fusiform prehensile)



41

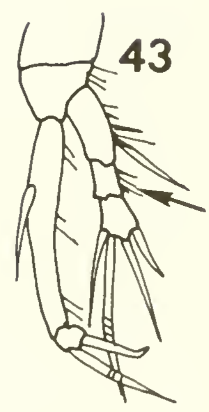
25 (*24*) Terminal segment endopod fourth leg (P_4) with
4 setae (Fig. 41) . . . *Paralaophonte* (fusiform prehensile)



42

25 (*24*) Terminal segment endopod fourth leg (P_4) with 3 setae
(Fig. 42) . . . . *Paronychocamptus huntsmani* (fusiform prehensile)

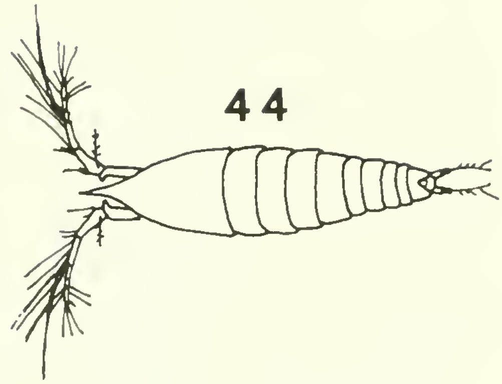
26 (*15*) Middle (or terminal if only 2-segmented) segment exopod first leg (P_1) with outer seta 27



43

26 (*15*) Middle segment exopod first leg (P_1) without outer area seta (Fig. 43)
. . . . *Arenopontia* (vermiform)

27 (*26*) First segment exopod first leg (P_1) with inner seta; maxilliped not prehensile; pelagic; strongly pointed rostrum (Fig. 44) . . . . *Aegisthus*

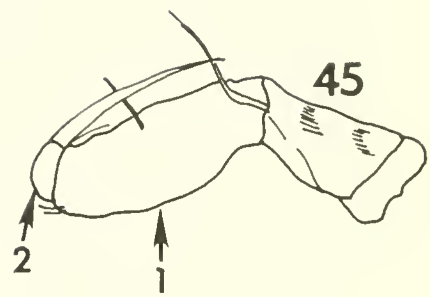


27 (*26*) Characters not combined as above 28

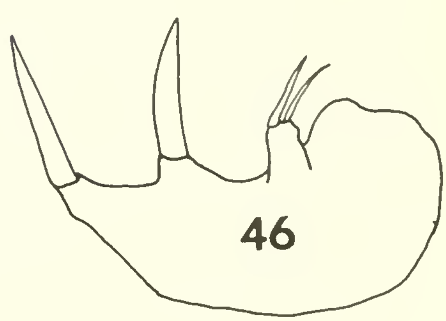
28 (*27*) Endopod fourth leg (P_4) at most 2-segmented 29

28 (*27*) Endopod fourth leg (P_4) 3-segmented 43

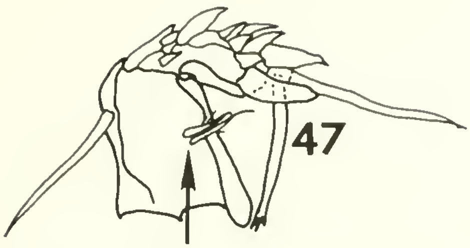
29 (*28*) Maxilliped prehensile (i.e., first segment elongate, terminal segment with small clawlike setae) (Fig. 45) 31

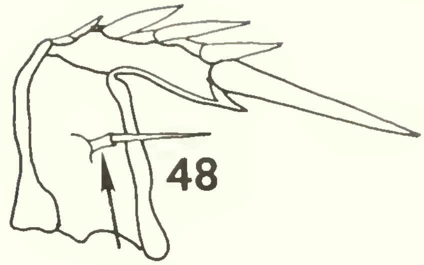


29 (*28*) Maxilliped not prehensile and greatly reduced (Fig. 46) or absent 30



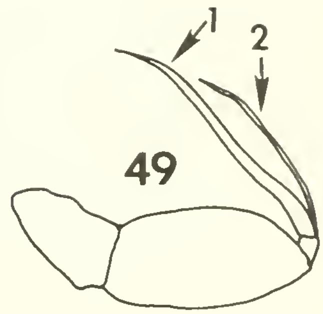
30 (*29*) Exopod antenna (A_2) represented by 2 setae (Fig. 47) . . . . *Leptocaris* (vermiform)





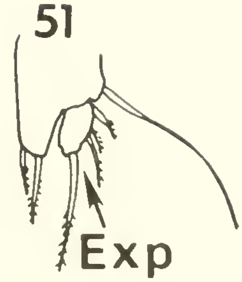
30 (*29*) Exopod antenna (A_2) a single segment with seta (Fig. 48) . . . . *D'Arcythompsonia* (vermiform)

31 (*29*) Maxilliped as in Figure 49 (i.e., two setae terminally) 32



31 (*29*) Maxilliped different 33

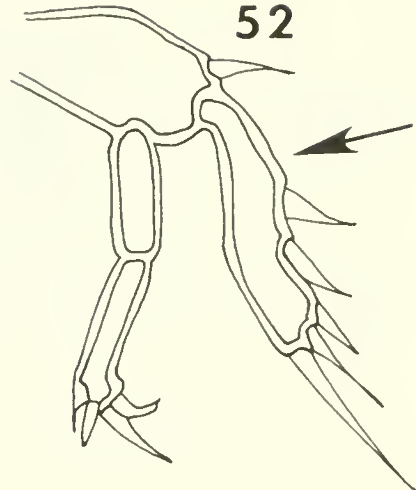
32 (*31*) Exopod and baseoendopod fifth leg (P) forming a common plate (Fig. 50) . . . . . . *Leptastacus* (vermiform)



32 (*31*) Exopod and baseoendopod fifth leg (P) not forming a common plate (Fig. 51) . *Paraleptastacus* (vermiform)

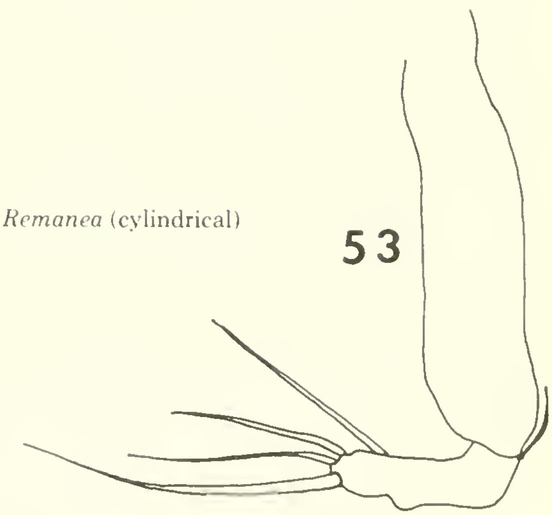
33 (*31*) Exopod first leg (P_1) at least 2-segmented 34

33 (*31*) Exopod first leg (P_1) 1-segmented (Fig. 52) . . .
. . . . "*Emertonia*" (cylindrical)



34 (*33*) Maxilliped with end claw and at most 1 seta 35

34 (*33*) Maxilliped with end claw and 2 or 3 setae (Fig. 53) . . . . *Remanea* (cylindrical)

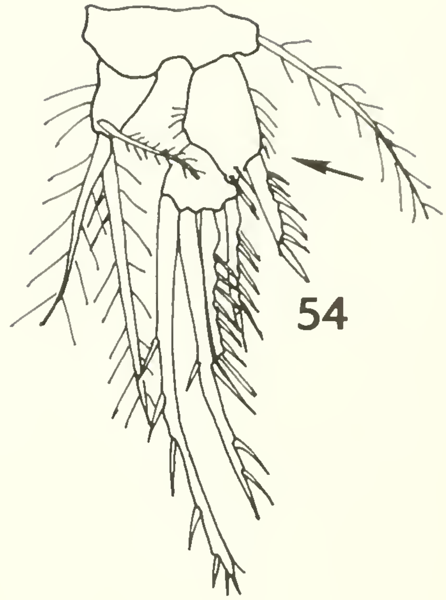


35 (*34*) Endopod second and third legs (P_2-P_3) 1-segmented 36

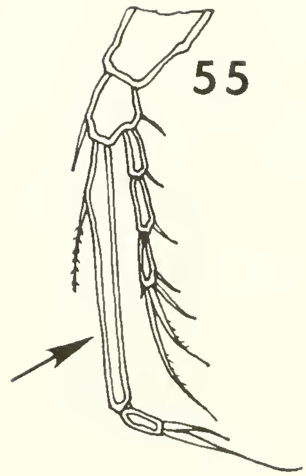
35 (*34*) Endopod second and third legs (P_2-P_3) 2-segmented 38

36 (35) Exopods second through fourth legs (P -P_4) 3-segmented 37

36 (35) Exopods second through fourth legs (P_2-P_4) 2-segmented (Fig. 54); exopod and endopod first leg (P) terminal seta ending in tuft of fine hairs (see Fig. 59) . . . . *Tryphoema* (cylindrical)

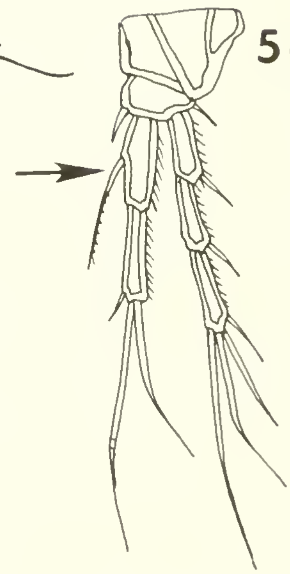


54



55

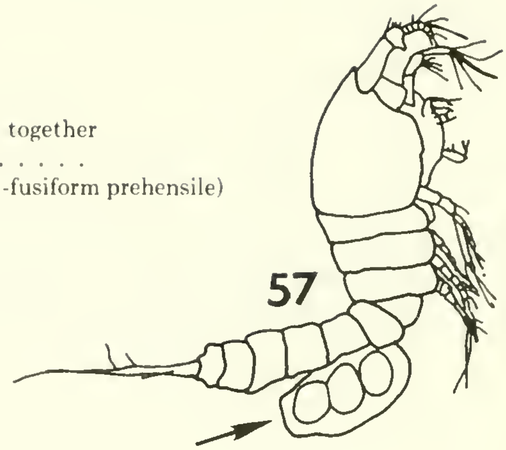
37 (36) Endopod first leg (P) prehensile; first segment endopod first leg extending beyond entire first leg exopod (Fig. 55) . . . . *Evansula* (vermiform)



56

37 (36) Exopod first leg (P) not prehensile; first segment endopod first leg not extending to end of entire first leg exopod (Fig. 56) . . . . *Stenocaris* (vermiform)

38 (*35*) Fifth leg (P_5) female a single large plate on each side which together form an egg pouch (Fig. 57) . . . . *Phyllopodopsyllus* (vermiform-fusiform prehensile)

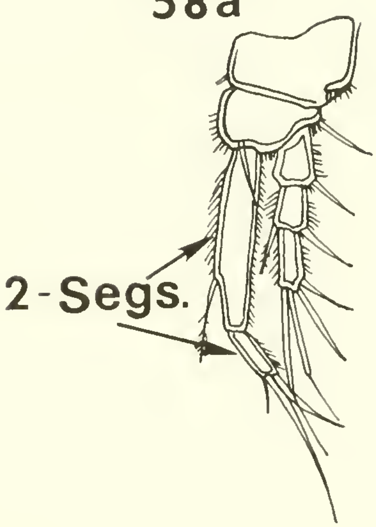


57

38 (*35*) Fifth leg (P_5) female either smaller or in two parts, i.e., a baseoendopod and an exopod 39

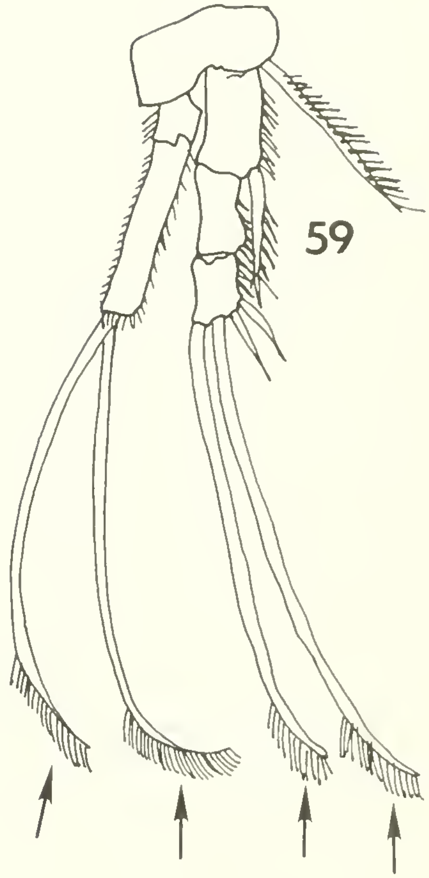
39 (*38*) Endopod first leg (P_1) prehensile. Endopod may be 2-segmented (Fig. 58a) or 3-segmented (Fig. 58b) . . . . *Mesochra* (fusiform prehensile)

58a



58b

39 (*38*) Endopod first leg (P_1) not prehensile and at most 2-segmented 40

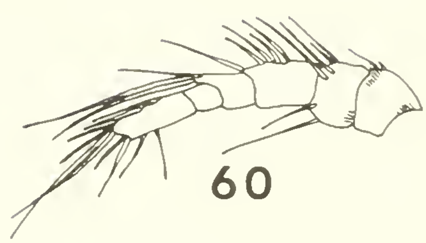


40 (*39*) Exopod and endopod first leg (P_1) terminal setae with tufts of fine hairs (Fig. 59) . . . . . *Rhizothrix* (cylindrical)

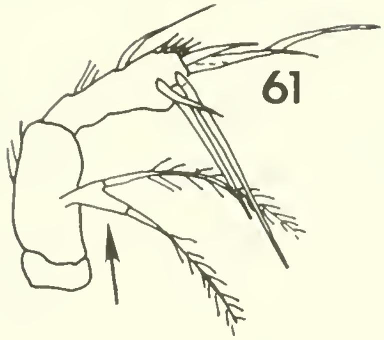
40 (*39*) Exopod and endopod first leg terminal setae without hairs 41

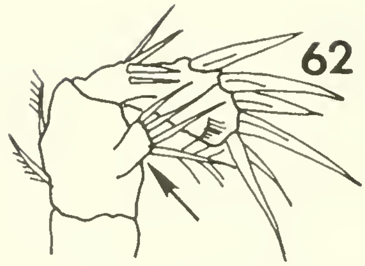
41 (*40*) Antennule (A_1) 4- to 5-segmented 42

41 (*40*) Antennule (A_1) 6-segmented (Fig. 60) . . . . *Cletocamptus* (cylindrical)



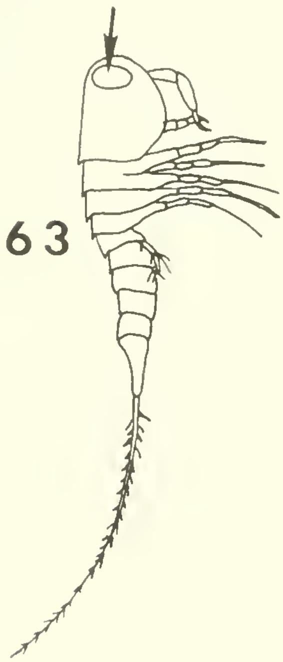
42 (*41*) Exopod antennae (A_2) with at most 2 setae (Fig. 61) . . . . *Enhydrosoma* (cylindrical)

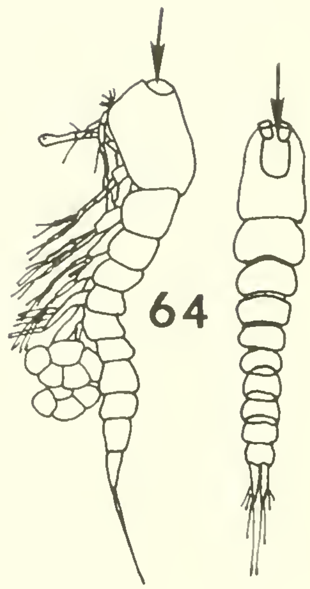




42 (*41*) Exopod antennae (A_2) with 3 or 4 setae (Fig. 62) . . . . *Nannopus* (fusiform compressed)

43 (*28*) Cuticular lenses present on cephalosome; pelagic (Figs. 63, 64) 44





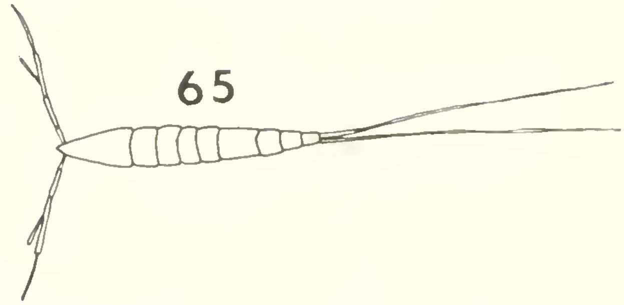
43 (*28*) Cuticular lenses on cephalosome absent 45

44 (*43*) Entire body slender with long caudal rami setae (Fig. 63); baseoendopod fifth leg (P_5) female with 3 setae . . . . *Oculosetella*

44 (*43*) Cephalon expanded, body narrow with short caudal rami setae (Fig. 64); baseoendopod fifth leg (P_5) female with 4 setae . . . . *Miracia*

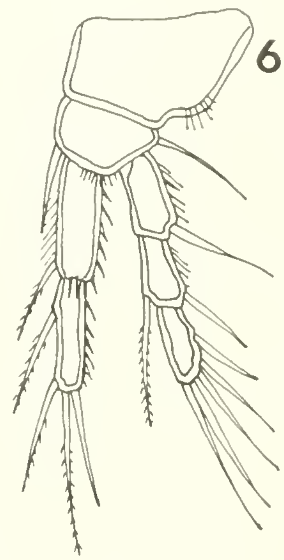
45 (*43*) Body tapered with extremely long caudal rami setae (Fig. 65); pelagic . . . . *Macrosetella* (fusiform)

65



45 (*43*) Body different 46

66

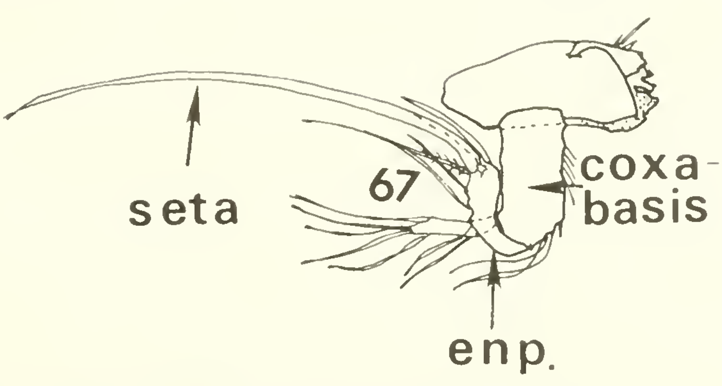


46 (*45*) Endopod first leg (P) not prehensile, i.e., each segment relatively equal in length (Fig. 66) 47

46 (*45*) Endopod first leg (P) prehensile, i.e., first segment elongate, terminal segment small with claw-like setae (see Figs. 73, 74, 80, 81) 51

47 (*46*) Coxa-basis, and endopod and endopod setae mandible greatly prolonged (Fig. 67) . . . . *Stenhelia* (*Delavalia*) (fusiform compressed)

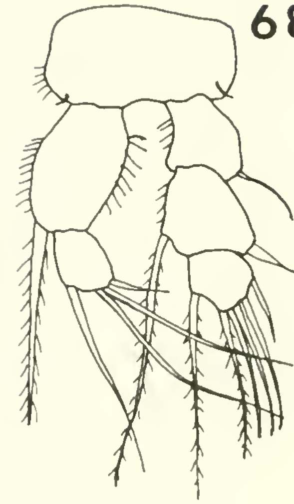
67



47 (*46*) Coxa basis, endopod, endopod setae mandible not greatly prolonged 48

48 (47) Endopod first leg (P_1) 3-segmented 49

68

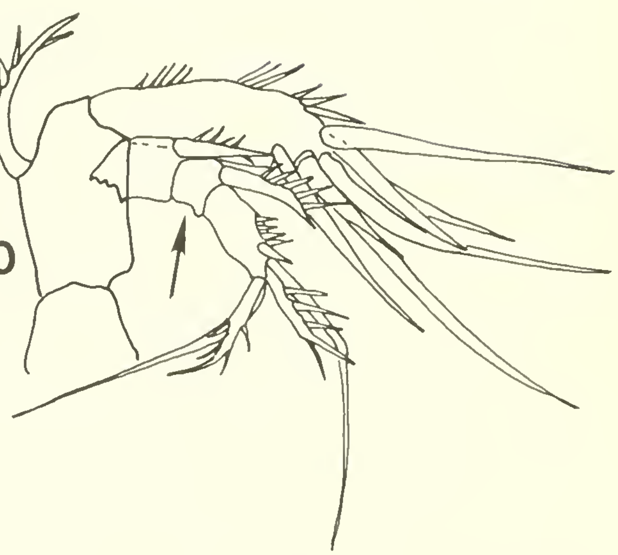


48 (47) Endopod first leg (P_1) 2-segmented (Fig. 68) . . . . *Tisbella* (fusiform depressed)

49 (48) Exopod antenna (A_2) 2-segmented; A_2 with *basis* (Fig. 69) 50

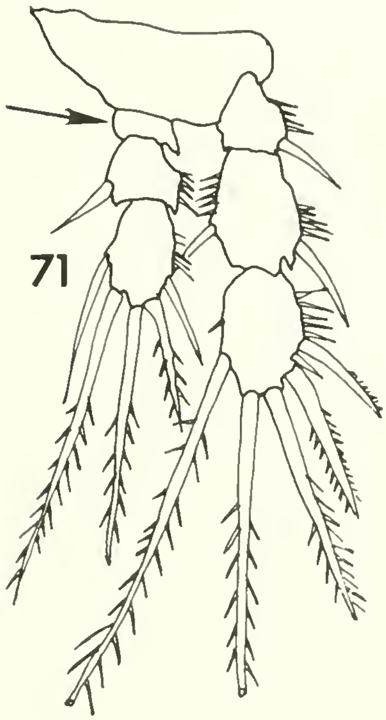
69

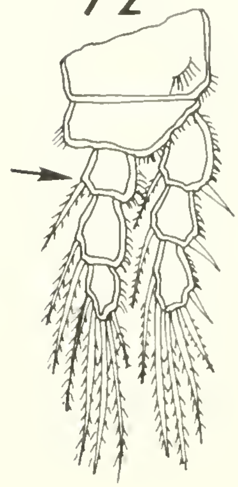
70



49 (48) Exopod antenna (A_2) 3-segmented; A_2 with *allobasis* (Fig. 70) . . . . *Thompsonula* (fusiform nonprehensile)

50 (*49*) First segment endopod second through fourth legs (P_2-P_4) very small without inner seta (Fig. 71) . . . . *Microarthridion* (fusiform nonprehensile)

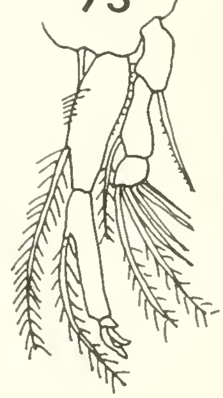

71

72


50 (*49*) First ségment endopod second through fourth legs (P_2-P_4) with inner setae (Fig. 72) . . . . *Tachidius* (fusiform nonprehensile)

51 (*46*) Coxa-basis, endopod, endopod setae mandible greatly prolonged (Fig. 67) . . . . *Stenhelia* (*Stenhelia*) (fusiform compressed)

51 (*46*) Coxa-basis, endopod, endopod setae mandible not greatly prolonged 52

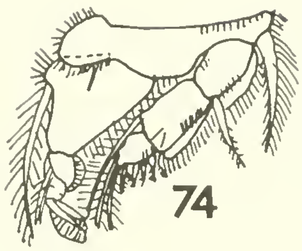
73


52 (*51*) Endopod first leg (P_1) as in Figure 73, i.e., first and second segments equal in length . . . . *Tisbe* (fusiform depressed)

52 (*51*) Endopod first leg (P_1) not as in Figure 73 53

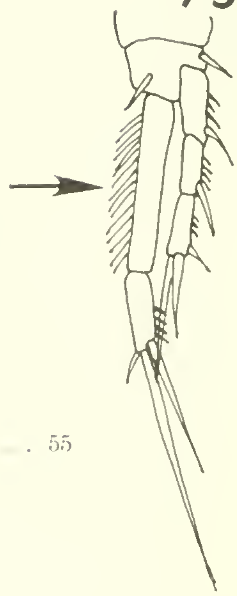
53 (52) Endopod first leg (P_1) as in Figure 74 . . . .*Sacodiscus* (fusiform depressed)

53 (52) Endopod first leg (P_1) not as in Figure 74 54



74

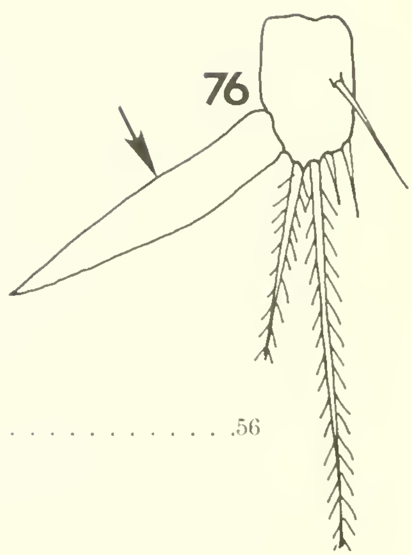
75



54 (53) Inner seta first segment endopod first leg (P_1) absent (Fig. 75) 55

54 (53) Inner seta first segment endopod first leg (P_1) present 57

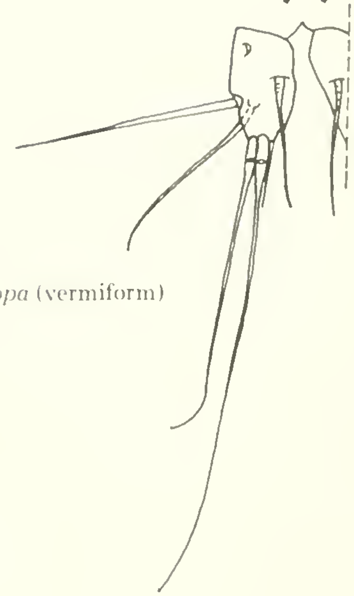
76



55 (54) Caudal rami with flame-shaped seta projecting laterally (Fig. 76) 56

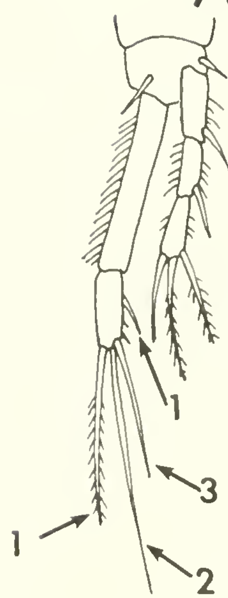
55 (54) Caudal rami without flame shape seta (Fig. 77) . . . . *Psammotopa* (vermiform)

77



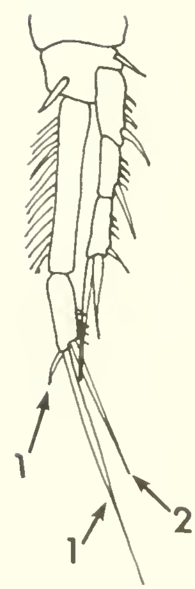
56 (55) Terminal segment endopod first leg (P_1) with 3 setae and a small spine (Fig. 78); exopod fifth leg (P_5) female with 5 setae; baseoendopod fifth leg (P_5) male with 3 setae . . . *Goffinella* (vermiform)

78

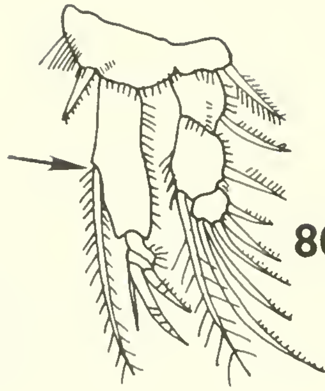


56 (55) Terminal segment endopod first leg (P_1) with 2 setae and a small spine (Fig. 79); exopod fifth leg (P_5) female with 6 setae; baseoendopod fifth leg (P_5) male with 2 setae . . . . *Protopsammotopa* (vermiform)

79

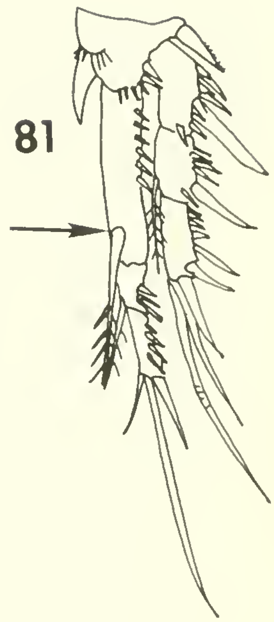


57 (54) Inner seta first segment endopod first leg (P_1) inserted in upper half of segment (Fig. 80) 58



80

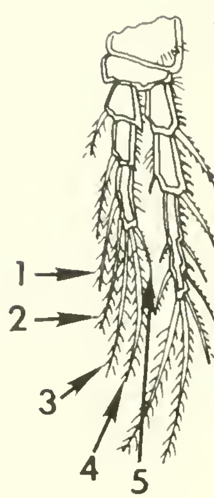
81



57 (54) Inner seta first segment endopod first leg (P_1) apically inserted (Fig. 81) 63

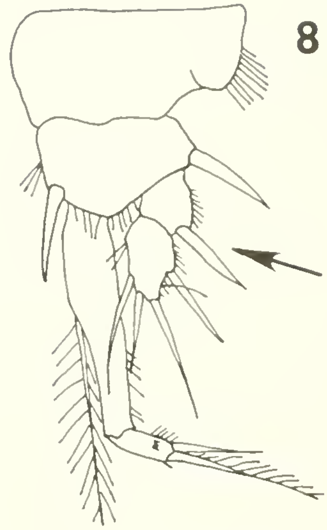
58 (57) Terminal segment endopod third leg (P_3) with 6 setae 59

82



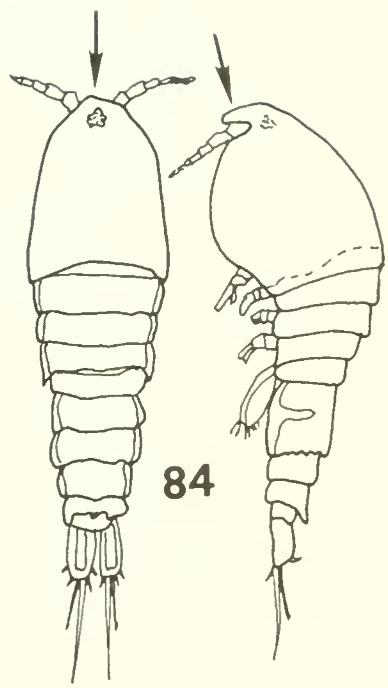
58 (57) Terminal segment endopod third leg (P_3) with 5 setae (Fig. 82) . . . . *Parastenhelia* (fusiform prehensile)

59 (58) Exopod first leg (P_1) 3-segmented 60



59 (58) Exopod first leg (P_1) 2-segmented (Fig. 83) . . . . .
. . . . *Diarthrodes* (fusiform compressed)

60 (59) Rostrum separate from rest of cephalosome and articulated at base 61

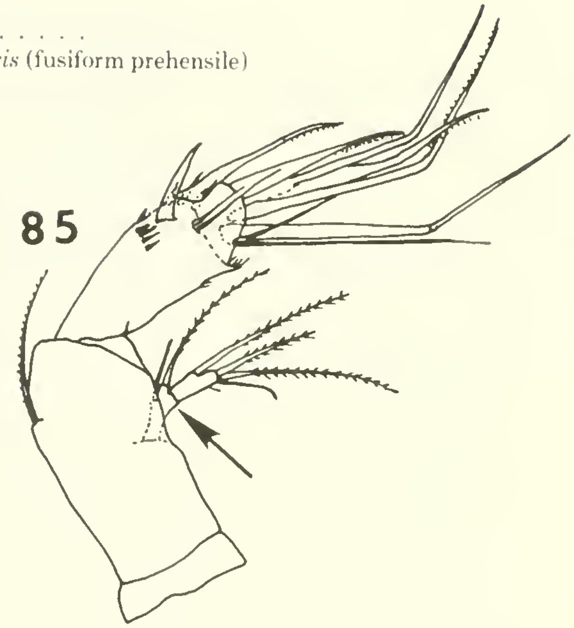


60 (59) Rostrum not separate from rest of cephalosome or articulated at base, directed downward (Fig. 84) . . .
. . . . *Thalestris* (fusiform compressed)

61 (*60*) Exopod antenna (A_2) 3-segmented 62

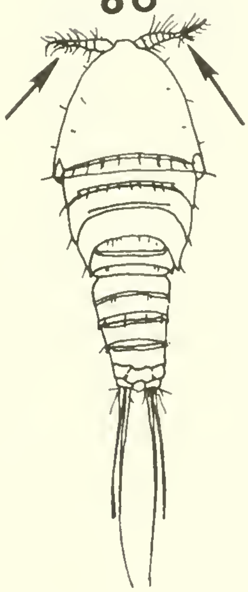
61 (*60*) Exopod antenna (A_2) 2-segmented (Fig. 85) . . . .
. . . . *Parathalestris* (fusiform prehensile)

85

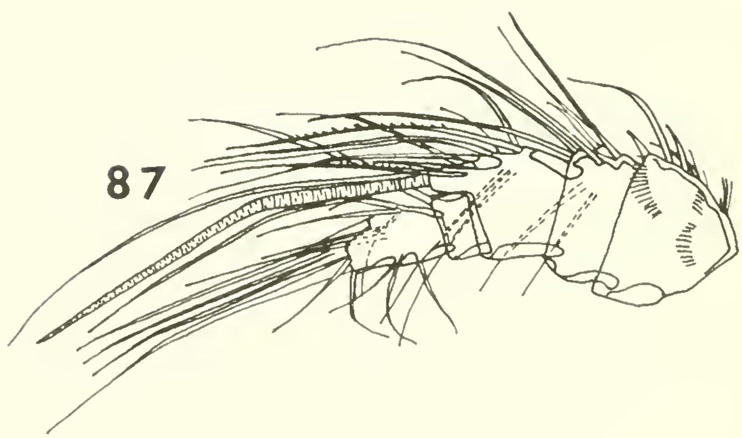


62 (*61*) Antennule (A_1) 7-9 segmented (Fig. 86) . . . . *Dactylopodia* (fusiform compressed)

86



87



62 (*61*) Antennule (A_1) 5-(indistinctly 6-)segmented (Fig. 87) . . . . *Paradactylopodia* (fusiform compressed)

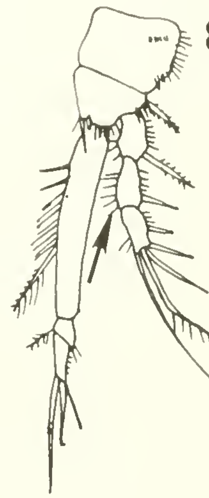
63 (*57*) Exopod antenna (A_2) 1- or 2-segmented 64

63 (*57*) Exopod antenna (A_2) 3-segmented 69

64 (*63*) Antenna (A_2) with basis (Fig. 69) 65

64 (*63*) Antenna (A_2) with allobasis (Fig. 70) 67

65 (*64*) Middle segment exopod first leg (P_1) with inner seta (Fig. 81) 66



88

65 (*64*) Middle segment exopod first leg (P_1) without inner seta (Fig. 88)
. . . . *Ameira* (fusiform prehensile)

66 (*65*) First segment exopod second through fourth legs (P_2-P_4) with inner seta; middle segment endopod second and third legs (P_2-P_3) with 2 setae (Fig. 89) . . . . *Pseudoamphiascopsis* (fusiform prehensile)

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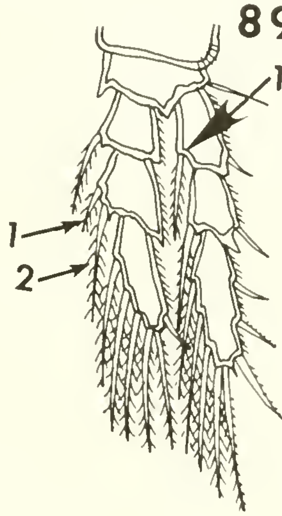
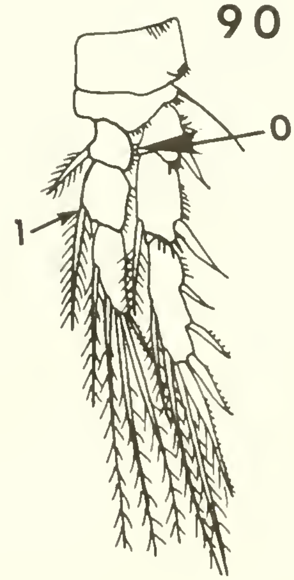
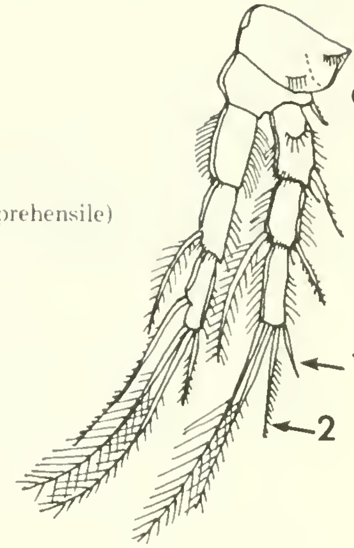


90



66 (*65*) First segment exopod second through fourth legs (P_2-P_4) without inner seta; middle segment endopod second and third legs (P_2-P_3) with 1 seta (Fig. 90) . . . . *Nitocra* (fusiform prehensile)

67 (*64*) Terminal segment exopod third and fourth legs (P_3-P_4) with 3 outer setae (total number of setae on terminal segment = 8) 68



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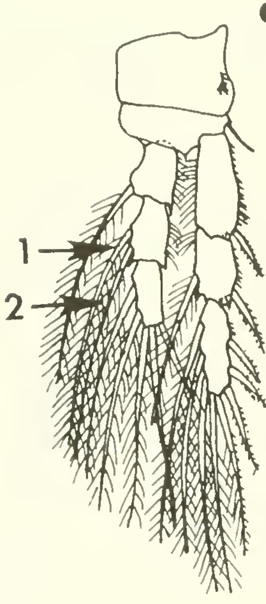
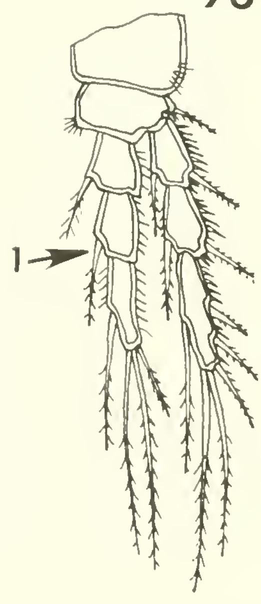
67 (*64*) Terminal segment exopod third and fourth legs (P_3-P_4) with 2 outer setae (maximum number of setae on terminal segment = 5) (Fig. 91) . . . . *Schizopera* (fusiform prehensile)

68 (*67*) Rostrum large reaching beyond first segment of antennule (A); middle segment exopod first leg (P_1) with inner seta; middle segment endopod second and third legs (P -P) with 2 inner setae (Fig. 92) . . . . *Diosaccus* (fusiform prehensile)

92

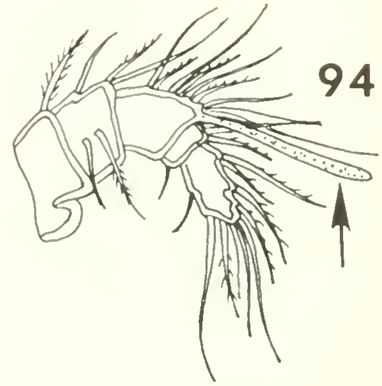


93



68 (*67*) Rostrum very small (represented by slightly pointed cephalon); middle segment exopod first leg (P_1) without inner setae (Fig. 88); middle segment endopod second and third legs (P -P) with 1 inner seta (Fig. 93) . . . . *Proameira* (fusiform prehensile)

69 (63) Antennule (A_1) 7- to 9-segmented, aesthetasc on segment 4 70



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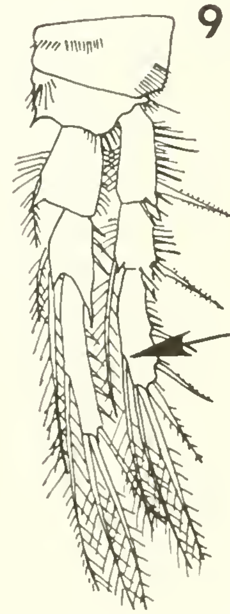
69 (63) Antennule (A_1) 5- or 6-segmented, aesthetasc on segment 3 (Fig. 94) . . . . *Robertsonia* (fusiform prehensile)

70 (69) First segment exopod second leg (P_2) without inner seta 71

70 (69) First segment exopod second leg (P_2) with inner seta 73

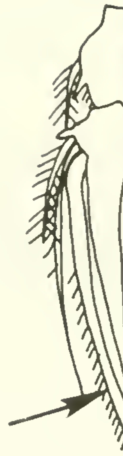
71 (70) Terminal segment exopod second leg (P_2) without inner seta (i.e., 0.1.023) 72



95

71 (70) Terminal segment exopod second leg (P_2) with inner seta (i.e., 0.1.123) (Fig. 95) . . . . *Robertgurneya* (fusiform prehensile)

72 (*71*) First segment endopod first leg (P_1) as a rule shorter than entire exopod; inner distal seta endopod second leg (P_2) male transformed into a spine (Fig. 96 . . . . *Paramphiasccella* (fusiform prehensile)

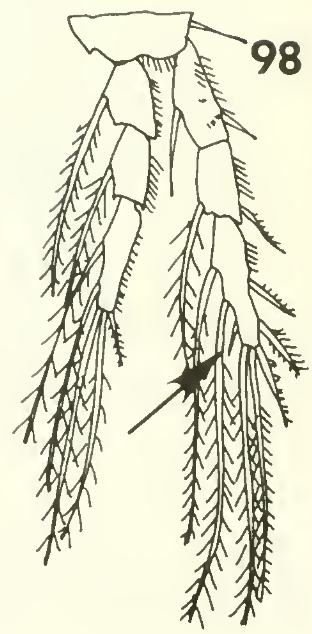


96

72 (*71*) First segment endopod first leg (P_1) as long as or longer than entire exopod; inner distal seta endopod second leg (P_2) male not transformed into a spine (Fig. 97) . . . . *Amphiascoides* (fusiform prehensile)

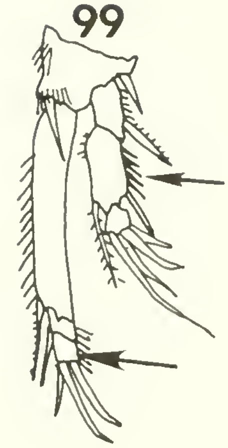
97

73 (*70*) Terminal segment exopod fourth leg (P_4) with 3 well-developed inner setae 74

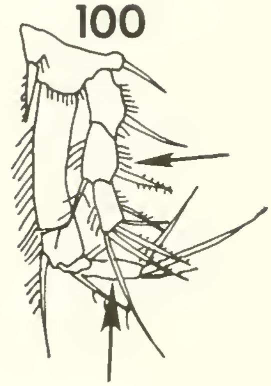


98

73 (*70*) Terminal segment exopod fourth leg (P_4) with at most 2 well-developed and a dwarfed inner seta (Fig. 98) . . . . *Amphiascus* (fusiform prehensile)



74 (73) Middle segment exopod first leg (P_1) prolonged; terminal segment endopod first leg (P_1) very short (Fig. 99) . . . . *Amphiascopsis* (fusiform prehensile)



74 (73) Middle segment exopod first leg (P_1) not prolonged; terminal segment endopod first leg (P_1) much longer than middle segment (Fig. 100) . . . . *Paramphiascopsis* (fusiform prehensile)

ANNOTATED SYSTEMATIC LIST

The following list of Harpacticoida (121 species) is arranged systematically in families after Lang (1948, 1965), with genera arranged alphabetically within the families and northeastern United States species alphabetically within the genera. The distribution for the northeastern United States is given as well as the world distribution of the species not endemic to the northeastern United States. The species preceded by * are doubtful records from the northeast.

Family Longipediidae Sars, 1903; Char. rev. Lang, 1948.

Longipedia helgolandica (Klie, 1949). *Longipedia coronata* Claus of Williams (1906), Fish (1925), and Wilson (1932). Multihabitat species occurring in the plankton, the benthos, and epiphytically. Reported from Woods Hole, Mass. and Narragansett Bay; occurs along the U.S. eastern coast, the Caribbean, Bermuda, and Germany. See González and Bowman (1965) for taxonomic revision.

Family Canuellidae Lang, 1948. [See Por (1967) for familial revision]

Canuella furcigera Sars, 1903. Known only from Wilson (1932) in Woods Hole. A circumeuropean species yet to be reported elsewhere in North America.

Scottolana canadensis (Willey, 1923). Coull (1972) recently placed this species in the genus *Scottolana*. Previously it belonged to *Canuella*. It occurs from Nova Scotia to the Gulf of Mexico and from New Jersey salt marches (Brickman 1972) and Nahant, Mass. (Coull unpubl. data).

Family Aegisthidae Giesbrecht, 1891.

Aegisthus mucronatus Giesbrecht, 1891. Offshore plankton (Wilson 1932). Cosmopolitan, planktonic.

Family Ectinosomidae Sars, 1903 (part); Olofsson, 1917.

Arenosetella fissilis Wilson, 1932. Woods Hole, Mass. (Wilson 1932; Pennak 1942a) and Baxter's Beach, Conn. (Zinn 1942), only known collection. A sandy beach interstitial species.

A. spinicauda Wilson, 1932. Wilson (1932) in Buzzards Bay, Mass. and Zinn (1942) Baxter's Beach, Conn. Not reported elsewhere, although I have collected it in South Carolina. Interstitial form.

Ectinosoma normani T. & A. Scott, 1894. Reported by Williams (1906) from Charleston Pond, R.I. and by Wilson (1932) from Woods Hole, Mass. Besides a circumeuropean distribution it has also been reported from Ceylon, India, Washington (USA), and Brazil. It is probably cosmopolitan.

Halectinosoma curticorne (Boeck, 1872). *Ectinosoma curticorne* Boeck of Williams (1906), Sharpe (1911), and Wilson (1932). Distributed over the North Atlantic and also reported from the White Sea (USSR), Brazil, and India.

H. elongatum (Sars, 1904). *Ectinosoma elongatum* Sars of Wilson (1932). One specimen from deep water off Gay Head, Martha's Vineyard. Also, known from Northern Europe and North Carolina (Coull 1971a).

H. kunzi Lang, 1965. New Jersey salt marshes by Brickman (1972). The only other known collections are from California (Lang 1965), North Carolina (Coull 1971a), and South Carolina (Coull unpubl. data).

Microsetella norvegica Boeck, 1864). A euplanktonic form from Narragansett Bay (Williams 1906), Woods Hole (Fish 1925), and Martha's Vineyard (Wilson 1932). Cosmopolitan species in relatively warm waters.

M. rosea (Dana, 1848). From plankton tows at Woods Hole (Fish 1925), Wilson (1932). A cosmopolitan species.

Pseudobradya pulchera Lang, 1965. Brickman (1972) reported this species from New Jersey salt marshes. It is also known from California (Lang 1965), Barbados (Coull 1970), and the Virgin Islands (Coull 1971b; Hartzband and Hummon 1974).

Sigmatidium minor (Kunz, 1935). Brickman (1972), New Jersey salt marshes, the only northeastern U.S. listing. A detrital species known previously from Europe.

Family D'Arcythompsoniidae Lang, 1936. The entire family is characteristic of low-salinity brackish waters.

D'Arcythompsonia inopinata Smirnov, 1934). Brickman (1972), New Jersey salt marshes. Known previously only from the Sea of Japan.

D. parva Wilson, 1932. Wilson (1932), brackish ponds on Chappaquiddick Island, the only record.

Leptocaris brevicornis (Douwe, 1904). *Horsiella brevicornis* Douwe of Brickman (1972). Brickman (1972), New Jersey salt marshes. Circumeuropean distribution also found in North and South Carolina and in mangrove swamps near Miami, Fla. (Hopper et al. 1973). Usually associated with detritus. Lang (1965) revised the genus.

Family Tachidiidae Sars, 1909; Char. rev. Lang, 1948.

Microarthridion littorale (Poppe, 1881). *Tachidius littoralis* Poppe of Williams (1906) and Wilson (1932). From Narragansett Bay (Williams 1906; Wilson 1932) and New Jersey salt marshes (Brickman 1972). North Atantic distribution.

Tachidius discipes Giesbrecht, 1881. *Tachidius brevicornis* Boeck of Williams (1906), Sharpe (1911), Fish (1925), and Wilson (1932). Phytal and benthos at Woods Hole, Mass. (Fish 1925; Wilson 1932), Long Island, N.Y. (Sharpe 1911; Coull unpubl. data), and Charleston Pond, R.I. (Williams 1906). A cosmopolitan species.

T. incisipes Klie, 1913. Brickman (1972) from New Jersey salt marsh detritus. Known from Northern Europe.

Thompsonula curticauda (Wilson, 1932). *Rathbunula custicauda* Wilson (1932). Sandy beaches at Woods Hole, Mass.

T. hyaenae (Thompson, 1889). *Echinocornus pectinatus* Wilson (1932); *Rathbunula agilis* by Wilson (1932). I have collected this species on sandy substrates at Nahant, Mass.; Beaufort, N.C.; and Georgetown, S.C. which to now is the known extent of its U.S. distribution. It is a sandy substrate species well known from Europe.

Family Harpacticidae Sars, 1904.

Harpacticus chelifer (Müller, 1776). Common in Rhode Island; Woods Hole, Mass.; and Long Island, N.Y. (Williams 1906; Sharpe 1911; Fish 1925; Wilson 1932). Worldwide distribution (Lang 1948).

**H. gracilis* Claus, 1863. Lang (1948) asserted Wilson's (1932) report of this species is in error, "offenbar false agaben." Never reported outside of Europe except for the Wilson report.

**H. tenellus* Sars, 1920. Algae, Eel Pond, Woods Hole (Wilson 1932). Circumeuropean distribution with the exception of Wilson's (1932) report, two North Carolina reports (Coull 1971a; Lindgren 1972), and a South Atlantic report (Tristan da Cunha, Wiborg 1964). Lang (1948) felt Wilson erred in identifying this species also.

H. uniremus Krøyer, 1942. Williams (1906), Fish (1925), and Wilson (1932) reported it from New England waters among vegetation. It is probably a cosmopolitan species.

Zaus goodsiri Brady, 1880. Wilson (1932) from Dennis, Mass. Known from the North Atlantic.

Zausodes arenicolus Wilson, 1932. Wilson's original description listed this species from sand at Martha's Vineyard. Further reported from along the U.S. east coast and the Caribbean.

Family Tisbidae (Stebbing, 1910); Char. rev. Lang, 1948. The genus *Tisbe* is presently being revised (B. Volkmann, pers. commun.).

Sacodiscus ovalis (Wilson, 1944). Humes (1960) reported this species associated with lobsters collected in Maine and New Hampshire. Also known as associated with Newfoundland, New Brunswick, and Quebec lobsters.

Tisbe bulbisetosa Volkmann-Rocco 1972. Collected from the Woods Hole region among algae by Bruno Battaglia (B. Volkmann pers. commun.). Also known from North Carolina and Italy (Volkmann-Rocco 1972).

T. furcata (Baird, 1837). Cosmopolitan species supposedly known from all over New England. The confused taxonomy of the genus (see Volkmann-Rocco

1971) makes it impossible to state with certainty whether the New England listings are correct. Volkmann (pers. commun.) thinks that most of the listings for *T. furcata* are incorrect although she has identified the "real" *T. furcata* from collections in the Woods Hole region.

T. gracilis (T. Scott, 1895). Yeatman (1963) redescribed this species from Chappaquiddick Island. According to Volkmann (1973) the species has a North Atlantic distribution.

T. holothuriae Humes 1957. Collected by Bruno Battaglia among algae at Woods Hole, Mass. (Volkmann pers. commun.). Known from most of Europe (Germany to Italy) and North Carolina.

T. longicornis (T. & A. Scott, 1895). Wilson (1932), plankton tows, Cuttyhunk Island. North Atlantic distribution.

**T. wilsoni* Seiwell, 1928. Seiwell (1928) and Wilson (1932), as a commensal on the sea pork *Amaroucium* at Woods Hole, Mass. No other listing. Volkmann (pers. commun.), after examining the types of *T. wilsoni*, feels that it is identical with, and therefore a junior synonym of, *T. gracilis*.

Tisbella pulchella (Wilson, 1932). *Chappaquiddicka pulchella* by Wilson (1932). From ponds, Chappaquiddick Island (Wilson 1932; Yeatman 1963). Also known from Bermuda.

Family Peltidiidae Sars, 1904.

Alteutha depressa (Baird, 1837). Sharpe (1911), Fish (1925), and Wilson (1932) from plankton tows among algae in and around Woods Hole, Mass. and Sharpe from Sheepshead Bay, Brooklyn, N.Y. This dorsoventrally flattened animal is typically epiphytic on shallow marine algae and grasses, with a circumeuropean distribution.

Family Pseudopeltidiidae Poppe, 1891.

Clytemnestra rostrata (Brady, 1883). Euplanktonic, collected by Wheeler (1899) 60 miles south of Martha's Vineyard. Cosmopolitan in relatively warm waters.

Family Tegastidae Sars, 1904.

Parategastes sphaericus (Claus, 1863). Amphipod-shaped, traditionally found among algae, reported by Williams (1906) from Narragansett Bay and by Fish (1925) and Wilson (1932) from Woods Hole. Known also from Europe.

Family Thalestridae Sars, 1905; Char. rev. Lang, 1948.

Dactylopodia tisboides (Claus, 1863). *Dactylopusia tisboides* (Claus) of Sharpe (1911) and Wilson (1932). Woods Hole region, associated with vegetation. Probably cosmopolitan, known from the Atlantic, Pacific, and Indian oceans.

D. vulgaris (Sars, 1905). *Dactylopusia vulgaris* Sars of Williams (1906), Sharpe (1911), Fish (1925), and Wilson (1932). Associated with algae in New England. North Atlantic distribution, one record from South Atlantic.

Diarthrodes dissimilis Lang, 1965. New Jersey salt marshes (Brickman 1972). Only other record is original description by Lang (1965) from California.

D. minutus (Claus, 1863). *Parawestwoodia minuta* (Claus) of Fish (1925); *Pseudothalestris minuta* Claus of Wilson (1932). Plankton tows, Woods Hole, Mass. (Fish 1925; Wilson 1932). North Atlantic distribution.

D. nobilis (Baird, 1845). *Pseudothalestris nobilis* (Baird) of Wilson (1932). From brackish ponds, Cape Cod, Mass. (Wilson 1932). North Atlantic-Mediterranean distribution.

D. pygmaeus (T. & A. Scott, 1895). *Pseudothalestris pygmaea* (T. Scott) of Wilson (1932). Plankton tow, Woods Hole, Mass. (Wilson 1932). Circumeuropean distribution and additional recordings from Brazil and North Carolina.

Paradactylopodia brevicornis (Claus, 1866). *Dactylopusia brevicornis* (Claus) of Wilson (1932). Cosmopolitan species Wilson (1932) collected in brackish Cape Cod and Martha's Vineyard ponds. Common in vegetation.

Parathalestris croni (Krøyer, 1842). *Halithalestris croni* Krøyer of Sharpe (1911), Fish (1925), and Wilson (1932); *Thalestris serrulata* Brady of Williams (1906). All northeastern reports are from plankton tows around Cape Cod and Gulf of Maine, except Williams' report from Narragansett Bay pilings. A North Atlantic species.

Thalestris gibba (Krøyer, 1842). Wilson (1932) reported *T. gibba* from fouled boards at Gloucester, Mass. and from plankton at Woods Hole. North Atlantic distribution.

Family Parastenheliidae Lang, 1948.

Parastenhelia spinosa (Fischer, 1860). *Microthalestris littoralis* Sars of Wilson (1932); *M. forficula* (Claus) of Wilson (1932). Plankton tows, Cuttyhunk Harbor and algae at Woods Hole (Wilson 1932). Cosmopolitan species usually associated with marine plants.

Family Diosaccidae Sars, 1906.

Amphiascoides debelis (Giesbrecht, 1881). A cosmopolitan species, northeastern United States record from Scituate, Mass. among algae (Rosenfield 1967).

Amphiascopsis cinctus (Claus, 1866). *Amphiascus cinctus* (Claus) of Wilson (1932); *Amphiascus obscurus* Sars of Fish (1925) and Wilson (1932). Cosmopolitan in algae and sediments.

Amphiascus ampullifer (Humes, 1953). *Mesamphiascus ampullifer* Humes (1953). Known only from its original description associated with the mouth parts of the American lobster (Humes 1953).

A. minutus (Claus, 1863). A cosmopolitan species reviewed by Lang (1965) and reported from Massachusetts Bay by Rosenfield (1967) and New Jersey salt marshes (Brickman 1972).

A. parvus Sars, 1906. Probably a cosmopolitan species. Known from Woods Hole region (Wilson 1932).

A. sinuatus Sars, 1906. Chappaquiddick Island (Wilson 1932). Lang (1948) stated that Wilson's designation is not correct but Lang was unable to clearly place this New England form.

Diosaccus tenuicornis (Claus, 1863). Charlestown Pond, R.I. (Williams 1906) and algae, Eel Pond, Woods Hole, Mass. (Sharpe 1911; Wilson 1932). Cosmopolitan.

Goffinella stylifer Wilson, 1932. This monotypic genus was recently placed in the Diosaccidae (Geddes 1968), resolving an enigma that has persisted for a long time (Lang 1948). Only collection is by Wilson (1932) from sandy beaches in Buzzard's Bay. See Wells (in press) for discussion of this species.

Paramphiascella commensalis Seiwell, 1928). *Amphiascus commensalis* Seiwell (1928); *A. commensalis* Seiwell of Wilson (1932); *Paramphiascoides commensalis* of Sleeter and Coull (1973). Symboint with the sea pork (*Amaroucium*) at Woods Hole (Seiwell 1928; Wilson 1932) and the wood-boring isopod *Limnoria tripunctata* at Duxbury, Mass. (Sleeter and Coull 1973). No other records are known.

P. fulvofasciata Rosenfield and Coull, 1974. Known from the original description from Quincy, Mass. (Rosenfield and Coull 1974) and from boards infested with *Limnoria* (Sleeter and Coull 1973). Recently found at Norfolk, England (G. F. Hicks pers. commun.).

P. hispida (Brady, 1880). *Amphiascus hispida* (Brady) of Wilson (1932). Cape Cod brackish ponds (Wilson 1932). North Atlantic distribution.

P. intermedia (T. Scott, 1896). *Amphiascus intermedius* (T. Scott) of Wilson (1932). Brackish ponds, Falmouth, Mass. (Wilson 1932) Northern European distribution with one record from North Carolina (Coull 1971a).

Paramphiascopsis longirostris (Claus, 1863). *Amphiascus longirostris* (Claus) of Wilson (1932). Brackish ponds, Chappaquiddick Island (Wilson 1932) North Atlantic distribution.

**P. pallidus* (Sars, 1906). *Amphiascus pallidus* Sars of Wilson (1932). Marine embayments Cape Cod, Martha's Vineyard (Wilson 1932). Known also from Norway and North Carolina. Lang (1948) believed that Wilson's designation was incorrect, but was not sure what species Wilson had.

Protopsammotopa species (Wells in press). Part of the collection identified by Wilson (1932) as *Goffinella stylifer* has recently been assigned to this species. The description is in press (Wells). Known only from Wilson's (1932) original collection and from sandy substrates in South Carolina (Coull unpubl. data).

Psammotopa vulgaris Pennak, 1942. The familial placement of this genus and species has been an enigma (see Pennak 1942b; Lang 1965). Gedes (1968) has recently placed it in the Diosaccidae and with good reason. For that reason it is included here. Pennak (1942a, b) found it in beaches in the Woods Hole area. It is now known from Europe, the Mediterranean, and North Carolina.

**Pseudoamphiascopsis attenuatus* (Sars, 1906). *Amphiascus attenuatus* Sars of Wilson (1932). Lang (1948) asserted that Wilson did not find this species and therefore its northeastern U.S. record is in doubt.

Robertgurneya dactylifera (Wilson, 1932). *Amphiascus dactylifer* Wilson (1932). Brackish ponds, Chappaquiddick Island (Wilson 1932), only known collection.

"*R. erythraeus*" (A. Scott, 1902). Lang (1948) synonymized *R. erythraeus* with *R. similis* a highly variable species. Rosenfield (1967) felt that Lang's synonomy was incorrect and that *R. erythraeus* must be reinstated as a valid species. Rosenfield (1967) asserted that his Massachusetts Bay species corresponds with the published description of *erythraeus* and not *similis* and therefore I have included it here.

Robertsonia propinqua (T. Scott, 1893). North Scituate, Mass., among algae (Rosenfield 1967). All other records of this species are from warm-temperature and tropical regions suggesting a circumtropical distribution with Rosenfield's exception, one record from Argentina and one from New Zealand.

Schizopera knabeni Lang, 1965. Previously known only from California. Rosenfield (1967) found it at North Scituate, Mass. and Brickman (1972) in New Jersey salt marshes. All records report it in brackish water detritus or algae.

Stenhelia (Stenhelia) divergens Nicholls, 1939. Brickman (1972) from New Jersey salt marshes. Other records from St. Laurent, Canada; New York; and North Carolina.

S. (Delvalia) arenicola Wilson, 1932. In addition to Wilson's (1932) original description from Buzzard's Bay, this sediment dweller has been reported from North Carolina and Brazil.

S. (D.) reflexa Brady and Robertson, 1880. Wilson (1932), 10 m off No Man's Land. Otherwise circumeuropean with Coull (1971a) reporting it from North Carolina.

Family Miracidae Dana, 1846.

Macrosetella gracilis (Dana, 1848). Planktonic, cosmopolitan. Woods Hole (Fish 1925; Wilson 1932), Gulf of Maine (Wilson 1932) 97 km south of Martha's Vineyard (Wheeler 1899).

Miracia efferata Dana, 1852. Planktonic, cosmopolitan. Wheeler (1899) and Wilson (1932) report it from 60 miles south of Martha's Vineyard.

Oculosetella gracilis (Dana, 1852). *Macrosetella oculata* (Sars) of Wilson (1932). Cosmopolitan, planktonic, collected by Wilson (1932) offshore of Cape Cod.

Family Metidae Sars, 1910.

Metis holothuriae (Edwards, 1891). *Ilyopsyllus sarsi* by Sharpe (1911). *Ilyopsyllus sarsi* Sharpe of Fish (1925); *Metis jousseaumei* (Richard) of Wilson (1932). A red animal, very common in algae and detritus around Woods Hole (Sharpe 1911; Fish 1925; Wilson 1932). Cosmopolitan distribution, known from most of the world.

M. ignea Phillipi, 1843. Plankton, Chatham, Mass. (Wilson 1932). North Atlantic distribution, with one report from the Indian Ocean (Wells and McKenzie 1973).

M. natans (Williams, 1906). *Ilyopsyllus natans* Williams (1906). Plankton, Narragansett Bay (Williams 1906; Wilson 1932). Only known collection.

Family Ameiridae Monard, 1927; Char. rev. Lang, 1936.

Ameira parvula (Claus, 1866). *Ameira tau* (Giesbrecht) of Wilson (1932). Chappaquiddick Island (Wilson 1932). Cosmopolitan.

**A. tenuicornis* T. Scott, 1902. Sand, Martha's Vineyard (Wilson 1932). Lang (1948) again stated that Wilson's (1932) identification is unsure. The only sure known records are from northern Europe (Lang 1948).

Nitocra chelifer Wilson, 1932. Intertidal sands Martha's Vineyard (Wilson 1932) and Baxter's Beach, Conn. (Zinn 1942). Only known collections.

N. platypus Daday, 1906. Reported from New Jersey salt marshes by Brickman (1972). Only other records are from South Pacific.

N. spinipes Boeck, 1864. *Nitocra medusaea* Humes (1953). Ponds, Nape Cod and Martha's Vineyard (Wilson 1932); low salinity, New Jersey salt marshes (Brickman 1972), Hudson River Estuary, Hackensack Meadows, N.J. (Coull unpubl. data); and exumbrellular surface of *Aurelia* from New Hampshire (Humes 1953). Cosmopolitan.

N. typica Boeck, 1864. Sand, Martha's Vineyard (Wilson 1932) and Southhampton Harbor, Long Island, N.Y. (Coull unpubl. data). Cosmopolitan.

**Proameira simplex* (Norman and T. Scott, 1905). Wilson (1932) reported this species as *Ameira simplex* from Chappaquiddick Island, however, Lang (1948) said Wilson was mistaken and this species is not truly known from the northeast.

Family Paramesochridae Lang, 1948; Char. rev. Kunz, 1962. See Kunz 1962 for familial revision.

"*Emertonia gracilis*" Wilson, 1932. Known from Woods Hole (Wilson 1932; Pennak 1942a) and Connecticut beaches (Zinn 1942). Only known collections. *Genus incertum et species incerta* (Lang 1948).

Remanea plumsa Pennak, 1942. Falmouth beaches (Pennak 1942a, b). Only known record.

Family Tetragonicipitidae Lang, 1948; Char. rev. Coull, 1973. See Coull (1973) for familial revision.

Phyllopodopsyllus aegypticus Nicholls, 1939. New Jersey salt marshes (Brickman 1972). Only previous record is from the Red Sea.

Family Canthocamptidae Sars, 1906; Char. rev. Monard, 1927; Char. rev. Lang, 1948. See Hamond (1971) for key to genus *Mesochra*.

Mesochra lilljeborgi Boeck, 1864. Chappaquiddick Island (Wilson 1932); Southampton Harbor, Long Island, N.Y. (Coull unpubl. data). North Atlantic distribution.

M. pygmaea (Claus, 1863). Sand, Martha's Vineyard (Wilson 1932). Long Island Sound algae (Coull unpubl. data). A cosmopolitan species recently reviewed by Hamond (1971).

M. rapiens (Schmeil, 1894). New Jersey salt marshes (Brickman 1972). Brackish species with circumeuropean distribution.

M. wolskii Jakubisiak, 1933. New Jersey salt marshes (Brickman 1972). Previously known from Cuba.

Family Cylindropsyllidae Sars, 1909; Char. rev. Lang, 1948. The entire family is traditionally found as interstitial fauna in sand.

Arenopontia arenardia (Pennak, 1942). *Psammoleptastacus arenardius* Pennak (1942b) and *P. arenardius* Pennak of Pennak (1942a) and Zinn (1942). Woods Hole beaches (Pennak 1942a, b) and beaches of Baxter's Point, Conn. (Zinn 1942). Only other reports are by Coull (1971a) and Lindgren (1972) from North Carolina.

Evansula incerta (T. Scott, 1892). Woods Hole beaches (Wilson 1932). Known previously from the Atlantic coast of Europe and North Carolina.

Leptastacus macronyx (T. Scott, 1892). Woods Hole beaches (Wilson 1932). Known from the North Atlantic (both sides) as far south as Ghana and Brazil.

Paraleptastacus brevicaudatus Wilson, 1932. Beaches of Woods Hole (Wilson 1932; Pennak 1942a) and Connecticut (Zinn 1942). Only known records.

P. katamensis Wilson, 1932. Woods Hole region beaches (Wilson 1932). Only record.

Stenocaris arenicola Wilson, 1932. Twelve (12) miles south of Martha's Vineyard at a depth of 35 m in sandy bottom (Wilson 1932). Only known record.

S. minor (T. Scott, 1892). Woods Hole beaches (Wilson 1932). North Atlantic distribution.

Family Cletodidae T. Scott, 1904.

Cletocamptus deitersi (Richard, 1897). *Attheyella bicolor* Wilson (1932); *Cletocamptus bicolor* (Wilson) of Brickman (1972) Yeatman (1963) asserted there is so much variability in this species that all "bicolor" species are varieties of *deitersi*. Furthermore, Yeatman examined Wilson's types and found that the female A_1 is 6-segmented and not 8-segmented as Wilson figured. Known in the northeast from Chappaquiddick Island (Wilson 1932; Yeatman 1963) and New Jersey salt marshes (Brickman 1972). Known from Hawaii and in the western North Atlantic, from Argentina to Massachusetts.

Enhydrosoma longifurcatum Sars, 1909. New Jersey salt marshes (Brickman, 1972). Probably cosmopolitan or at least North Atlantic, from much of Europe and the U.S. eastern coast.

E. propinquum (Brady, 1896). Collected on mud flats in Lynn Harbor, Mass. (Coull unpubl. data). A North Atlantic-Mediterranean species with one report from the Pacific. Known as far south as South Carolina on the U.S. east coast.

Nannopus palustris Sars, 1880. New Jersey salt marshes (Brickman 1972). Common intertidal salt marsh species, cosmopolitan.

Rhizothrix tenella (Wilson, 1932). *Quintanus tenellus* Wilson (1932). Woods Hole beaches (Wilson 1932). Also known from South Carolina (Coull unpubl. data).

Tryphoema ramabula (Pennak, 1942). *Adelopoda ramabula* Pennak (1942b); *A. ramabula* Pennak of Pennak (1942a) and Zinn (1942). Known only from New England beaches (Pennak 1942a, b; Zinn 1942).

Family Laophontidae T. Scott, 1904.

Harrietella simulans (T. Scott, 1894). Associated with the marine woodboring isopod *Limnoria* (Sleeter and Coull 1973). North Atlantic distribution.

Heterolaophonte capillata (Wilson, 1932). *Laophonte capillata* Wilson (1932); *H. noncapillata* Lang (1948). Coull (1976) redescribed this species designating it, as required by the Zoological Code, *H. capillata*. Only known record is Wilson's (1932) original find at Martha's Vineyard.

H. manifera (Wilson, 1932). *Laophonte manifera* Wilson (1932). Plankton tows around Cape Cod (Wilson 1932). Only known record.

**H. strömi* (Baird, 1834). *Laophonte strömi* (Baird) of Wilson (1932). Sediment and algae dweller known in northeast from sands of Cape Cod (Wilson 1932). North Atlantic distribution. Lang (1948) claimed Wilson erred in identifying this species.

Laophonte cornuta Phillippi, 1840. Cosmopolitan species in a variety of substrates, northeastern U.S. listing by Wilson (1932) from brackish ponds Cape Cod.

L. longicaudata Boeck, 1864. Plankton, Woods Hole (Sharpe 1911). Brackish ponds Martha's Vineyard (Wilson 1932). North Atlantic distribution.

Onychocamptus chathemensis (Sars, 1905). New Jersey salt marshes (Brickman 1972). A cosmopolitan brackish water species.

O. horridus (Norman, 1876). *Laophonte horrida* Norman of Wilson (1932). Plankton, Woods Hole (Wilson 1932). Commonly found among algae. North Atlantic distribution.

O. mohammed (Blanchard and Richardson, 1891). *Laophonte mohammed* Blanchard and Richardson of Wilson (1932). Brackish ponds, Cape Cod (Wilson 1932); New Jersey salt marsh (Brickman 1972). Cosmopolitan.

O. talipes (Wilson, 1932). *Laophonte talipes* Wilson (1932). Only known finding is Wilson's (1932) original record from sandy beaches at Woods Hole.

Paralaophonte congenera congenera (Sars, 1908). Associated with *Limnoria* burrows, Duxbury, Mass. (Sleeter and Coull 1973). Circumeuropean and western North Atlantic distribution on a variety of substrates.

Paronychocamptus wilsoni Coull, 1976. *Laophonte capillata* female by Wilson (1932); *Paronychocamptus capillatus* (Wilson) of Lang (1948). Coull (1976) has recently renamed and redescribed this species. The species is known from the original Wilson (1932) report at Katama Bay, Martha's Vineyard as well as Nahant, Mass. and Georgetown, S.C. (Coull 1976).

P. huntsmani (Willey, 1923). New Jersey salt marshes (Brickman 1972). Only other records are from New Brunswick, Canada and Chesapeake Bay (Coull unpubl. data).

**P. nanus* (Sars, 1908). *Laophonte nana* Sars of Wilson (1932). In sand, at 65 m, 5 km south of No Man's Land, Martha's Vineyard (Wilson 1932). Lang (1948) felt Wilson's determination was not correct, but Lang was not sure what species Wilson had.

Pseudonychocamptus proximus (Sars, 1908). *Laophonte proxima* Sars of Wilson (1932). Sandy beaches, Cape Cod (Wilson 1932). North Atlantic distribution.

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SYSTEMATIC INDEX

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The Board established the format for the "Marine Flora and Fauna of the Northeastern United States," invites systematists to collaborate in the preparation of manuals, review manuscripts, and advises the Scientific Editor of the National Marine Fisheries Service.

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COORDINATING EDITOR'S COMMENTS

Publication of the "Marine Flora and Fauna of the Northeastern United States" is most timely in view of the growing universal emphasis on environmental work and the urgent need for more precise and complete identification of coastal organisms than has been available. It is mandatory, wherever possible, that organisms be identified accurately. Accurate scientific names unlock the great quantities of biological information stored in libraries, obviate duplication of research already done, and make possible prediction of attributes of organisms that have been inadequately studied.

Bruce C. Coull commenced his study of harpacticoid copepods in 1965 working on the meiobenthic harpacticoids of Bermuda. In 1968 he began a postdoctoral research associateship at The Duke University Marine Laboratory, Beaufort, North Carolina and dealt with the systematics and ecology of shelf, slope and deep sea harpacticoids off the Carolinas. In 1970 he joined the faculty of Clark University, Worcester, Mass. and initiated studies on the New England harpacticoids. This key represents an extension of that work. Bruce Coull's present position began in 1973, and he is continuing his studies on the ecology and systematics of meiobenthic copepods.

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