

Pycnogonida of the Western Pacific  
Islands, XI: Collections from  
the Aleutians and Other  
Bering Sea Islands, Alaska

C. ALLAN CHILD

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Pycnogonida of the Western Pacific  
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the Aleutians and Other  
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*C. Allan Child*



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## ABSTRACT

Child, C. Allan. Pycnogonida of the Western Pacific Islands, XI: Collections from the Aleutians and Other Bering Sea Islands. Alaska. *Smithsonian Contributions to Zoology*, number 569, 30 pages, 10 figures, 1995.—This report treats 35 pycnogonid species from the Bering Sea and the northwestern Pacific with specimens from several island groups located there; the Commander Islands, Aleutian Islands, Pribilof Islands, and one lot from St. Lawrence Island. Six new species are described, illustrated, and compared with their nearest relatives: *Eurycyde arctica*, *Eurycyde depressa*, *Eurycyde muricata*, *Pycnogonum stylidium*, *Nymphon hirsutum*, and *Colossendeis dalli*. Four additional species inadequately described by W.H. Hilton (1942) are redescribed fully and illustrated as if new: *Achelia megova*, *Achelia ovosetosa*, *Pallenopsis (Bathypallenopsis) pacifica*, and *Colossendeis microsetosa*. New distribution data and a diagnosis are given for the other 25 species, and new morphological information is included for each species where applicable. Several specimens are identified only to *Nymphon* or *Pycnogonum* for lack of adults or recognizable specimens.

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# Pycnogonida of the Western Pacific Islands, XI: Collections from the Aleutians and Other Bering Sea Islands, Alaska

*C. Allan Child*

## Introduction

This report treats 35 pycnogonid species from the Aleutians, the Commander Islands, the Pribilof Islands, and one lot from St. Lawrence Island, in the Bering Sea and northwest Pacific Ocean. The material discussed is assembled from two general sources; first, that collected by several recent expeditions collecting benthic material from the zoologically little known islands adjacent to and in the Bering Sea. Leased commercial vessels or a research vessel were used for these expeditions.

The report also treats a second source: many lots collected nearly one hundred years ago or even longer by the U.S. Fisheries Research Steamer *Albatross* from the same Aleutian localities, during the 1890s and in 1906, and in addition, from the Commander Islands, Bering Island, in the Russian North Pacific. A number of shallow lots also were collected in 1873–1874 by William H. Dall, a prominent malacologist and explorer. All of the lots collected many years ago had been identified either by William A. Hilton (and some reported by him in a way that makes it difficult or impossible to decipher their locality), by Louis Giltay (never published), or by Joel W. Hedgpeth, in the 1930s and 1940s, and deposited in the National Museum. Almost all of the early-dated lots were never reported in the literature, particularly those by Hedgpeth who identified many National Museum collections besides those he reported in 1948 and 1949. Giltay's unfortunate early death cut short his excellent work directed toward publishing the many collections he had examined.

All of these lots were reexamined, particularly Hilton's material, and either validated or reidentified as other species. Several of Hilton's new species (1942, 1943), previously

described only preliminarily from the Aleutians and other nearby Islands remain valid, and are fully described and illustrated below for the first time. Others of Hilton's species from these localities have already been described and illustrated previously, predominantly the *Nymphon* species, by Hedgpeth (1949).

There are six new species described herein from the Aleutians. These are *Eurycyde arctica*, *E. depressa*, *E. muricata*, *Pycnogonum stylidium*, *Nymphon hirsutum*, and *Colossendeis dalli*. Hilton's four species, *Achelia megova*, *A. ovosetosa*, *Colossendeis microsetosa*, and *Pallenopsis (Bathypallenopsis) pacifica*, are also treated as new species for purposes of description and illustration in this report. Some specimens of *Nymphon* and other genera are identified only to genus for lack of adults.

ACKNOWLEDGMENTS.—I would like to thank Jon Norenberg of the Smithsonian Oceanographic Sorting Center (SOSC) for making these recent collections from their Bering Sea Program available to me, and for providing data and other information necessary for inclusion herein. Acknowledgment is made to the Division of Polar Programs of the National Science Foundation for a United States Antarctic Research Program contract to the SOSC, which provided some travel allowances for the collectors. I wish to thank the National Oceanographic and Atmospheric Administration (NOAA) for additional help, assistance, and the use of one of their vessels within the scope of this Bering Sea program.

All specimens and types are deposited in the National Museum of Natural History, Smithsonian Institution, and are listed under the continuing catalog system of the old U.S. National Museum collections. The older Aleutian type specimens are deposited in the Museum of Natural History collections under the author's original name, even if the species name has been subsequently reduced to synonymy.

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## Family AMMOTHEIDAE Dohrn

### Genus *Achelia* Verrill, 1900

It is increasingly obvious that the North Pacific rim must be the spreading or dispersal point and possibly even the point of origin for the genus *Achelia*. There are approximately 25 known species of this genus found from the coast of California, through British Columbia and Alaska, to the Russian Far East and Japan, to say nothing of the many species known from the southern rim of the Pacific, possibly a second area of dispersal. The exact number of known North Pacific species is difficult to pin down because of several questionable species described by Losina-Losinsky from damaged or otherwise nontypical specimens. Several of her new species were relegated to synonymy when more became known of their morphology, while others remain valid. Nevertheless, it is evident that speciation in this genus has taken place in the North Pacific over what has probably been a longer period than elsewhere, as evidenced by the species count as it is presently known. Hedgpeth (1947:40) stated that *Achelia* is one of several genera that prefer the temperate latitudes of both hemispheres, and are poorly represented in the tropics. This assumption has been borne out by many subsequent collecting records, including the boreal records in this report. The Antarctic coasts, although hardly temperate, could be a secondary dispersal area for the genus because of the many localized species found there. This is not to say that we now know all of the *Achelia* species of the Pacific by any means. Those species of the islands of the central and southern Pacific are poorly known at best, and it is obvious that many more species have yet to be described from the vastness and diversity of this body of water. The genus tends to have many endemic littoral species, and the coasts from California to Japan have not been thoroughly sampled for such endemics or even for well known far ranging species. It can be expected that there will be additional species of *Achelia* found on these pycnogonid-rich coasts.

### *Achelia alaskensis* (Cole)

*Ammothea alaskensis* Cole, 1904:266-268, pl. 12: fig. 4; pl. 17: figs. 4-12.—Child, 1987:552-553 [literature].  
*Achelia alaskensis*.—Hedgpeth, 1949:289.  
*Achelia kamtschatica*? Losina-Losinsky, 1961:92-93, fig. 17.

MATERIAL EXAMINED.—Aleutian Islands, Attu Island, Chichagoff Harbor, coll. W.H. Dall, sta 163 (1007), 1873 (1♀); Kiska Island, Kiska Harbor, coll. W.H. Dall, sta 166 (1003), 1873 (1♂ with eggs); same locality, coll. W.H. Dall, sta 187 (1013), 7 Jul 1873 (2♂, 2 juv); same locality, coll. W.H. Dall, sta 188 (1014), 7 Jul 1873 (1♂, 3♀, 3 juv); same locality, coll. W.H. Dall, sta 211 (1025), 1873 (2♂ with eggs, 1♀, 2 juv); same locality, coll. W.H. Dall, sta 235 (1036), 1873 (1 juv, 2 dissected trunks); same locality, coll. W.H. Dall, 18 m, no sta, 1873 (2♀, 2 juv).

Pribilof Islands, St. Paul Island (type locality), coll. W.H.

Dall, sta 721 (1163), 24 Jul 1874 (1 juv); same locality, east rookery, coll. G.D. Hanna, intertidal, 11 May 1914 (1♀, 3 juv).

Aleutians, W of Amchitka Island, 51°29.9'N, 178°39.6'E, 154 m, trawl, R/V *Lets Go*, cruise 861, sta 57, 18 Aug 1986 (1 juv).

DISTRIBUTION.—Widely distributed across the North Pacific from the Korean and Japanese coasts, the Russian Arctic, the Aleutians and Alaska, British Columbia, Canada, to as far south as San Francisco, California, in 0-180 m.

DIAGNOSIS.—Tiny species, leg span slightly less than 10 mm. Trunk circular in outline, lateral processes contiguous, armed with 0-3 short setae. Ocular tubercle very low, not as tall as its diameter, eyes well pigmented. Proboscis typical. Abdomen extending only to distal tip of first coxae, fourth leg pair. Chelifores moderately short, with short distal setae, chelae stubs oval.

Palps 8-segmented, short. Ovigera typical. Legs moderately slender with few setae, propodus slender with 3 primary heel spines and 2 lateral smaller spines, sole with 6-7 short small spines. Auxiliaries about 0.7 as long as main claw.

REMARKS.—Some specimens look very much like the figures of Losina-Losinsky's *A. kamtschatica*, including the slender proboscis of her dorsal view, so I have little hesitation in assigning her species as a synonym. There is a fair amount of variation in this species, placed in a genus sometimes displaying excessive variation in some of its species.

### *Achelia borealis* (Schimkewitsch)

*Ammothea borealis* Schimkewitsch, 1895:36-40, pl. 2: figs. a,b; 1907:5-9, pl. 1.  
*Ammothea borealis* var. *japonica* Losina-Losinsky, 1933:57-59, fig. 9.  
*Ammothea elongata* Hilton, 1942g:96.  
*Achelia borealis* Hedgpeth, 1947:24, 27, fig. 13b; 1949:286-287, fig. 41h-m; 1963:1338.  
non *Ammothea* (*Achelia*) *borealis*.—Schimkewitsch, 1930:139-144, figs. 34-37 [= *Achelia neotenica* Krapp, 1986].

MATERIAL EXAMINED.—Gulf of Alaska, S of Kodiak Island, off Albatross Bank, 55°26'N, 155°26'W, 1271 m, R/V *Albatross*, sta 3340, 29 Aug 1890 (1♂, holotype, *A. elongata* Hilton).

DISTRIBUTION.—Taken sparsely in widely scattered localities around the rim of the northern Pacific, the species is recorded from northern Japan, several places off the Russian Far East coasts, and at Point Barrow in the Arctic Ocean, in 80-175 ft (24-53 m), 175-349 fm (320-638 m), and at various depths within these ranges. This is the first time the species has been recorded in the Gulf of Alaska, where it was collected in about double the maximum depth recorded elsewhere.

DIAGNOSIS.—Similar to *Achelia superba*: relatively slender habitus, well separated and long lateral processes, a tall ocular tubercle, very long abdomen, moderately long chelifores, and dorsodistal tubercles on lateral processes. Similarities mostly superficial and differences become clear on close comparison.

Lateral process tubercles of *A. borealis* larger and more robust than those of *A. superba*, latter species with much longer lateral processes and legs, particularly with regard to its long very slender propodus. Palp and oviger segments of *A. borealis* longer and having different length ratios among segments, chelifores shorter than those of *A. superba*, and ocular tubercle of *A. borealis* much shorter than that of Loman's species.

REMARKS.—In his haste to publish so many new species in a preliminary way, Hilton missed the correct determinations of about half of the specimens he examined. This is one of the species he missed.

There are no specimens of this species in these Bering Sea collections and indeed, the only specimens available for comparison are those few from Hedgpeth's Hokkaido, Japan, and Point Barrow studies. I include this Gulf of Alaska specimen to complete the reexamination and analysis of Hilton's *Achelia* species from Alaska.

#### *Achelia brevirostris* Losina-Losinsky

*Achelia brevirostris* Losina-Losinsky, 1961:95-97, fig. 19.—Nakamura and Child, 1991:3-5, fig. 1A-F.

MATERIAL EXAMINED.—Aleutians, S of Adak Island, 51°55.6'N, 176°52.8'W, 201 m, R/V *Miller Freeman*, cruise 833, sta 47, 5 Aug 83 (1♀).

DISTRIBUTION.—Rarely taken, previous records are only from off Sakhalin Island in the Sea of Okhotsk in 48 m and from two localities in northern Japan in 400 to 479 m. This additional record extends its distribution eastward to the western Aleutians, but within known depths.

DIAGNOSIS.—Typical of genus; trunk circular in dorsal outline, lateral processes separated by tiny intervals, armed with paired low dorsodistal tubercles bearing setae. Ocular tubercle twice taller than its diameter, eyes prominent. Proboscis typical. Abdomen long, extending to distal tip of second coxae, fourth leg pair.

Chelifore scapes moderately long, slender, equal to first and second palp segments in length. Palp second segment equal in length to fourth, otherwise typical. Oviger seventh segment with many lateral setae longer than segment diameter. Legs moderately long, armed with many tiny short ventral setae and fewer longer dorsal setae. Propodus fairly short, armed with 3-4 heel spines and 10-12 shorter sole spines, auxiliary claws about 0.6 length of main claw.

REMARKS.—This rare species remained little known until Nakamura and Child (1991) found it in Japanese waters. Its relatively small trunk and first coxae tubercles, moderately tall ocular tubercle, and long abdomen serve as recognition characters.

#### *Achelia latifrons* (Cole)

*Ammonothea latifrons* Cole, 1904:263-266, pl. XI: fig. 3; pl. XVI: figs. 1-9; pl. XVII: figs. 1-3.—Schmitt, 1934:68.—Hedgpeth, 1941:256 [key].—Hilton, 1942b:295-296, pl. 41; 1942g:93.

*Achelia latifrons*.—Stock, 1954:96-97.—Kim and Hong, 1986:46-48, fig. 8.

MATERIAL EXAMINED.—Aleutians, Kiska Island, Kiska Harbor, coll. W.H. Dall, 1872 (1♀); same locality, coll. W.H. Dall, 1873 (2♀, 1 juv); same locality, coll. W.H. Dall, 7 Jul 1873 (1♂, 2♀); same locality, coll. W.H. Dall, sta 164 (1001), 1873 (1♂ with eggs); same locality, coll. W.H. Dall, sta 167 (1000), 16-22 ms, 1873 (1♂); same locality, coll. W.H. Dall, sta 211 (1025), intertidal, 1873 (2♂ with eggs, 1♂, 1♀); Kiska Island, Biological Survey, coll. W.L. Schmitt, 1940? (5♂).

Aleutians, Amchitka Island, Constantine Harbor, coll. W.H. Dall, sta (1049), at shore, 5 Aug 1873 (1♀ with eggs, 1♂, 1♀).

Aleutians, Adak Island, coll. W.H. Dall, sta 315 (1015), 1873 (1♀); same locality, S side of Clam Lagoon, 51°55'N, 176°34'W, coll. J. Rosewater, sta JR-10-79, intertidal, on sabellid worm tubes, 8 Jun 1979 (1♀, 1 juv).

Aleutians, S of Tanaga Island, 51°52.3'N, 177°44.5'W, 119 m, R/V *Miller Freeman*, cruise 833, sta 42, 4 Aug 83 (1♂, 1 juv.).

DISTRIBUTION.—Another species with a very wide distribution across the North Pacific, from the Korean coast through the western Aleutian Islands, Pribilof Islands, Alaskan coast, to middle California and possibly to southern California. The specimens from cruise 833, station 42 above probably represent the deepest record for this normally shallow-water species. Hilton published a record from Santa Barbara, California, but I have not seen the specimen. His identifications have averaged about 50% correct, of specimens I have examined.

DIAGNOSIS.—Extremely setose/spinose species. Trunk circular in dorsal view, with 4-5 short median spines or sometimes spines lacking. Lateral processes contiguous, with many laterodistal setae continuing laterally on all first coxae, also with slender paired dorsodistal tubercles with spines at their tips. Ocular tubercle moderately long, eyes prominent. Proboscis slightly inflated, ovoid. Abdomen very long, with long paired dorsal spines.

Palp segments short, second slightly longer than fourth, all with few dorsal setae and few ventral setae on distal 5 segments. Chelifores with many setae on scapes, most longer than segment diameter, and several short dorsal tubercles each with spine. Chela fingers atrophied, with single spine. Oviger with 3-4 rows of short spines on major segments, 4 strigilis segments with paired denticulate spines.

Leg tibiae with many long dorsal setae, some originating on low tubercles, femur with few similar lateral and ventral setae. Second coxae of posterior 2 pairs of legs with genital spur slightly longer than segment diameter. Femur with dorsodistal tubercle as long as segment diameter, tubercle bearing tiny cement gland tube laterally near tip. Propodus slender, well curved, with 3 major heel spines, 8-10 very small sole spines, and several lateral and dorsal setae. Claw long, little curved, auxiliaries slender, about 0.6 the main claw length.

REMARKS.—In spite of the numerous specimens available, this species has not appeared very often in the literature. It is a

handsome species that would be difficult to confuse with any other of the many and varied North Pacific species. It has such heavily setose distal lateral processes and first coxae that this character alone separates it from any other North American species, and it only comes close in morphology to some of the Russian Far Eastern species of Losina-Losinsky (1961) such as *A. salebrosa* and *A. kurilensis*. The latter species is quite likely *A. latifrons*, but has a few differences in its tubercles that may or may not fall within the wide variations among species of this genus.

*Achelia megova* (Hilton)

FIGURE 1

*Ammothea megova* Hilton, 1942g:95-96.

**MATERIAL EXAMINED.**—Alaska, Port Etcher, coll. W.H. Dall, sta 669 (1140), 22-33 m, 1874 (1♂, holotype, USNM 81492); Aleutians, Amchitka Island, Constantine Harbor, coll. W.H. Dall, sta 305 (1049), 5 Aug 1873 (7♂ with eggs, 1♀, 3 juv, non-types).

**DISTRIBUTION.**—Known from Amchitka Island in an unknown but shallow depth, and "Port Etcher" (probably Port Etches, Prince William Sound, Gulf of Alaska, 60°20'N, 146°37'W), in 22 to 33 m. The species apparently has not been taken since these specimens were reported by Hilton. He listed another male from Attu Island that is actually a specimen of *A. alaskensis*.

**DESCRIPTION.**—Species fairly small, leg span about 11 mm. Trunk oval in dorsal view, lateral processes closely crowded except distally, armed, as cephalic segment anterior and dorsal abdomen, with field of short dorsodistal spines each on raised button tubercle. Ocular tubercle very low, wider at base than

tall, eyes prominent. Proboscis egg-shaped, quite inflated. Abdomen moderately long, extending to tip of first coxae, fourth leg pair.

Palp segments short, with many lateral and dorsal spines, none longer than segment diameters, distal 5 segments with many short ventral setae. Chelifores small, slender, scape armed with few short lateral and distal setae, chelae bulbous, with single seta each.

Legs moderately slender, very spinose with only few spines longer than their segment diameters. First coxae with lateral line of short spines and dorsodistal group of spines on low button tubercles. Second coxae of posterior 4 legs with short ventrodistal sexual spur. Cement gland pore very tiny, on low rounded dorsodistal tubercle on femur. Propodus robust, slightly curved, with 3 heel spines, 8-9 short sole spines, and rows of lateral and dorsal spines. Claw robust, fairly short, auxiliary claws little more than half main claw length.

**MEASUREMENTS** (in mm).—Trunk length (chelifore insertion to tip 4th lateral processes), 1.56; trunk width (across 2nd lateral processes), 1.36; proboscis length (ventral), 1.26; abdomen length, 0.7; third leg, coxa 1, 0.44; coxa 2, 0.51; coxa 3, 0.4; femur, 0.88; tibia 1, 0.78; tibia 2, 0.79; tarsus, 0.18; propodus, 0.6; claw, 0.28.

**REMARKS.**—This is another species similar in some ways to *A. latifrons* Cole, particularly in the many lateral spines of the first coxae and the very spinose legs. The trunk of Hilton's species is oval and not round in dorsal aspect as is Cole's species, and its lateral processes also lack the conspicuous dorsodistal tubercles of *A. latifrons*. The ocular tubercle of Cole's species is considerably longer than that of this species, and other differences make it clear that this species is not *A. latifrons*. It is unlike any other *Achelia* found in Alaskan waters.



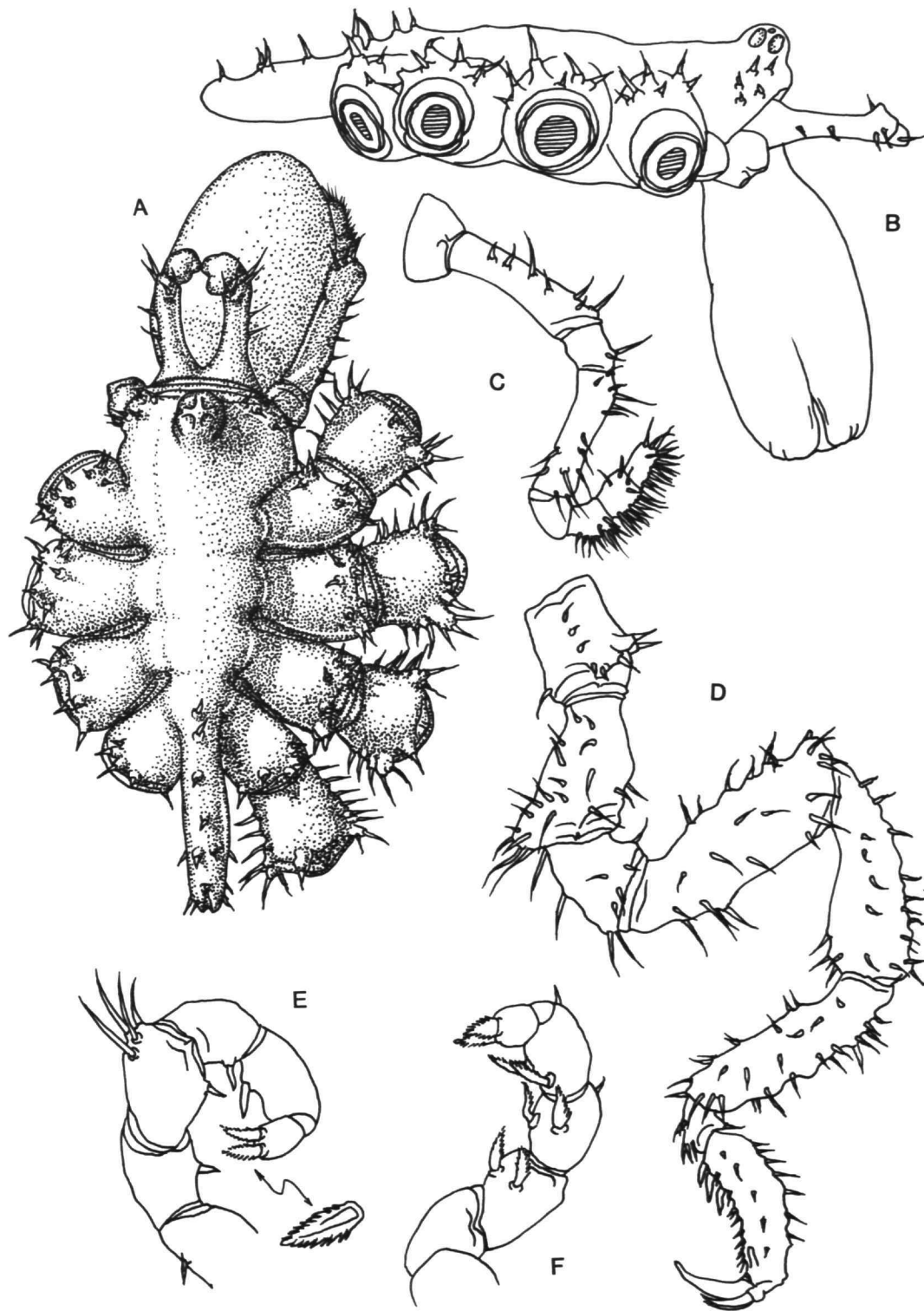


FIGURE 1.—*Achelia megova* (Hilton), Amchitka male: A, trunk, dorsal view; B, trunk, lateral view; C, palp, enlarged; D, third leg; E, oviger terminal segments, with enlarged spine. Amchitka female: F, oviger terminal segments.

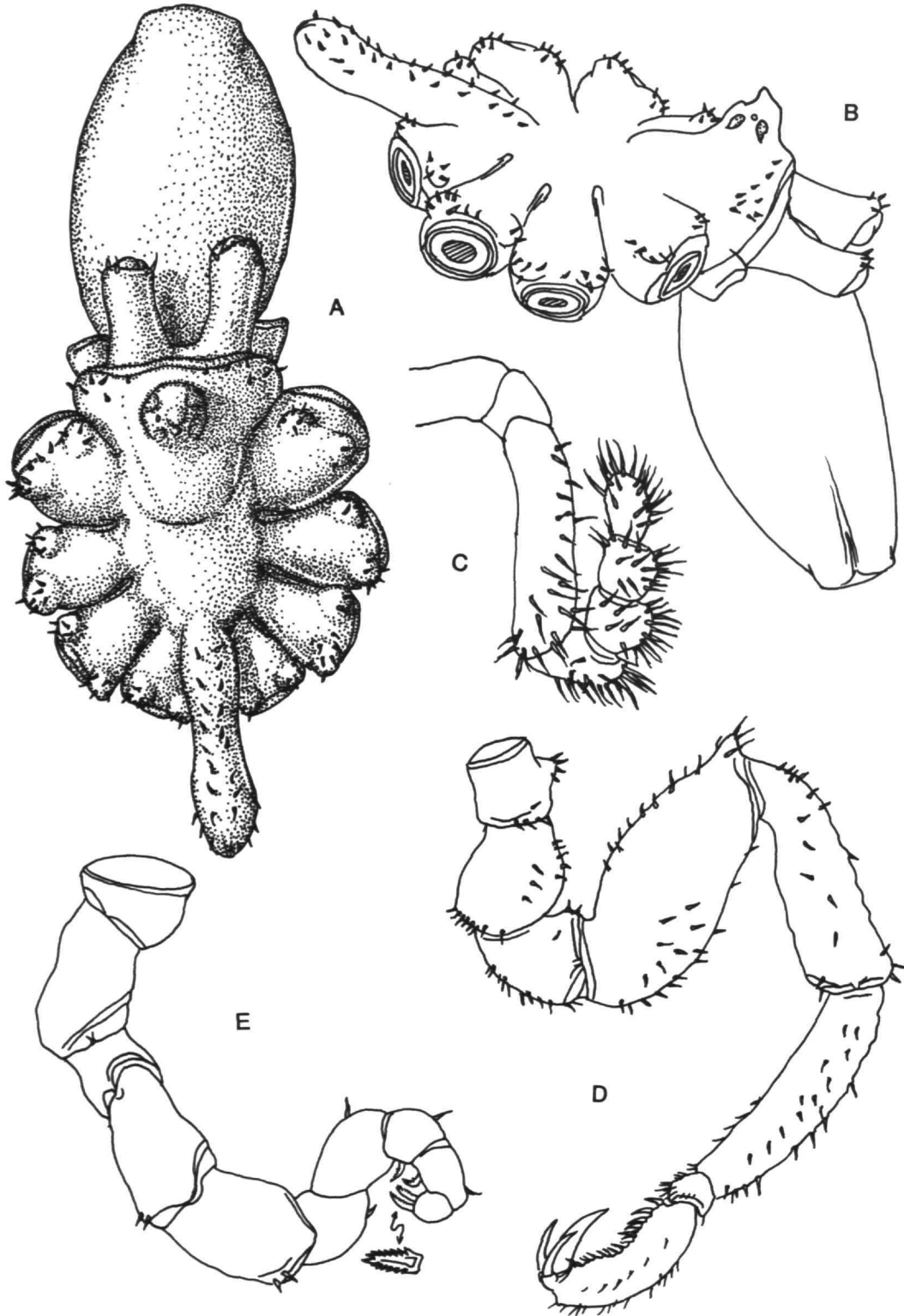


FIGURE 2.—*Achelia ovoetosa* (Hilton), holotype female: A, trunk, dorsal view; B, trunk, lateral view; C, palp distal segments, enlarged; D, third leg; E, oviger, with enlarged spine.

*Achelia ovozetosa* (Hilton)

FIGURE 2

*Ammothea ovozetosa* Hilton, 1942g:95.

**MATERIAL EXAMINED.**—Aleutians, Amchitka Island, Constantine Harbor, on beach, coll. W.H. Dall, sta 305 (1049), 5 Aug 1873 (1♀, holotype, USNM 81493).

**DISTRIBUTION.**—Hilton's species is known only from this unique type specimen taken intertidally in the western Aleutian Islands.

**DESCRIPTION.**—With leg span of about 21.5 mm, species almost twice as large as Hilton's *A. megova*. Trunk circular in dorsal view, as wide as long, without segmentation sutures. Lateral processes contiguous, armed with low laterodistal swellings bearing groups of very short spines. Cephalic segment anterior rim also bearing groups of short spines. Ocular tubercle a low cone with broad base, a tiny posterior tubercle, and very small slightly pigmented eyes. Abdomen long, carried horizontally and extending beyond first coxae of fourth leg pair, armed with 2 dorsal rows of short spines. Proboscis length subequal to that of trunk, very inflated, barrel-shaped, small oral surface flat.

Chelifore scapes broad, almost cylindrical, only slightly inflated distally, about twice as long as wide, with several short dorsodistal spines. Chela hardly extending beyond scape rim, a semicircle with 1 tiny spine. Palp segments short, very setose distally, distal 4 segments hardly longer than wide, armed with many short setae. Oviger (female) very short, no segment longer than twice its maximum diameter, longer segments with 2–3 tiny distal spines, distal 4 segments with denticulate spines in the formula 0 : 1 : 1 : 2. Spines with many lateral lobes.

Major leg segments short, femur longest with second tibia slightly shorter and first tibia shortest, all segments armed with scattered short spines. Femur inflated, with small conical dorsodistal tubercle bearing 2–3 setae slightly longer than proximal spines. Propodus typical, well curved, heel with 6 spines (4 larger proximal, 2 smaller distally), 12–14 short sole spines. Claw half propodal length, robust, auxiliaries about 0.6 length of main claw.

Male characters unknown.

**MEASUREMENTS** (in mm).—Trunk length (chelifore insertion to tip 4th lateral processes), 2.02; trunk width (across 2nd lateral processes), 2.02; proboscis length, 1.98; abdomen length, 1.22; third leg, coxa 1, 0.58; coxa 2, 0.74; coxa 3, 0.8; femur, 2.06; tibia 1, 1.74; tibia 2, 1.81; tarsus, 0.25; propodus, 1.14; claw, 0.59.

**REMARKS.**—This species is unlike any other known *Achelia* from the North Pacific, but has slight similarity to *A. spatula* Nakamura and Child, 1983, and the preceding species, *A. megova* (Hilton). Both *A. spatula* and *A. ovozetosa* share the characters of a circular trunk in dorsal view, a long horizontal abdomen, robust chelifores, a large barrel-shaped proboscis,

and relatively short leg segments armed with few short spines. In most other characters, Hilton's species is very different from *A. spatula*, which has a tall ocular tubercle, dorsodistal leg tubercles, much longer chelifore, palp, and oviger segments, and low but conspicuous laterodistal lateral process tubercles, which bear a single distal spine. The low rounded tubercles with many spines on each lateral process of Hilton's *A. ovozetosa* and its low ocular tubercle and long abdomen are the outstanding characters differentiating this species from the wealth of northern Pacific *Achelia* species. The many dorsodistal spines on the lateral processes of *A. megova* are similar in size to those of *A. ovozetosa*, but those of *A. megova* are each situated on a tiny low tubercle whereas the spines of *A. ovozetosa* are on the lateral processes themselves rather than each having its own tiny tubercle. There are no other similar characters except for the long abdomens and low ocular tubercles of the two species.

*Achelia pribilofensis* (Cole)

*Ammothea pribilofensis* Cole, 1904:270–273, pl. 12: fig. 6; pl. 18: figs. 7, 8; pl. 19: figs. 1–8.—Schmitt, 1934:68.—Hilton, 1942g:96.

*Ammothea (Achelia) pribilofensis*.—Schimkewitsch, 1930:156–160, figs. 46–49.

*Achelia pribilofensis*.—Hedgpeth, 1949:287.—Losina-Losinsky, 1961:91.

**MATERIAL EXAMINED.**—Commander Islands, Bering Island, coll. N. Grebnitski, 189–? (1♀); same locality, at Nikolski, coll. R/V *Albatross*, 1906 (other data missing) (1♀).

Aleutians, Attu Island, shore, coll. R/V *Albatross*, 10–11 Jun 1906 (1 juv).

Aleutians, Kiska Island, Kiska Harbor, coll. W.H. Dall, sta 164 (1001), 16–22 m, 1873 (1♂ with eggs, 1♂); same locality, coll. W.H. Dall, sta 165 (1002), 11–15 m, 1873 (3♂ with eggs, 2♂, 5♀, 1 juv); same locality, coll. W.H. Dall, sta 235 (1036), 18 m, 1873 (2♂).

Aleutians, Amchitka Island, Constantine Harbor, coll. W.H. Dall, sta (1049), intertidal, 5 Aug 1873 (2♂ with eggs, 1 juv).

Aleutians, Adak Island, coll. R/V *Albatross*, 2 Jul 1893 (1♂ with eggs, 1♀).

Aleutians, Unalaska Island, Captains Bay, Eider Village anchorage, coll. W.H. Dall, sta 21 (967), 1872? (1♀).

Pribilofs, St. Paul Island, coll. W. Palmer, sta (644), 19 Jul 1890 (type locality) (2♀, 2 juv); same locality, coll. W. Palmer, 19 Jul 1890 (3 juv); same locality, Lagoon Reef, coll. G.D. Hanna, 1913–14 (1 juv); St. George Island, coll. G.D. Hanna, 1913 (1♀); same locality, E Rookery, coll. G.D. Hanna, intertidal, 12 May 1914 (1♂, 3 juv); same locality, coll. G.D. Hanna, intertidal, 5 Dec 1914 (25+ spec.); same locality, coll. G.D. Hanna, 20 Jun 1924 (1♂).

**DISTRIBUTION.**—Taken in many localities from northern Japan, the Kurile Islands, other Russian Far East localities, and to the east in the Aleutian and Pribilof Islands in the Bering Sea. The species has a known shallow depth range from the shore to at least 50 m.



**DIAGNOSIS.**—Trunk ovoid in dorsal view, lateral processes closely crowded, with tiny dorsodistal tubercles. Ocular tubercle conical, pointing anteriorly, eyes small, at base of tubercle. Proboscis massive, greatly swollen distally, less so proximally, lips flat. Abdomen moderately long, carried horizontally, bearing small conical dorsodistal tubercle.

Chelifores moderately short, scape with narrowly conical dorsodistal tubercle, chelae oval, with endal fold denoting atrophied finger. Palps long, slender, heavily setose distally, distal segments 5–7 each with ventral projection. Ovigera large, segments 3–6 with many lateral setae, seventh with lateral bulge having many setae, strigilis segments small. Legs with many short dorsal spines, low dorsolateral tubercles on the first and third coxae, moderately long sex pore spur on posterior 4 second coxae, and modest dorsodistal tubercle on each femur. Propodus with 3 heel spines and many lateral and sole setae. Claw slender, auxiliaries about half main claw length.

**REMARKS.**—This large species is characterized by a large bulbous proboscis, a low anterior-leaning ocular tubercle, an abdomen bearing a conical dorsodistal tubercle, 3 distal palp segments with setose ventral extensions, and legs with very many short spines and setae.

#### *Achelia superba* (Loman)

*Ammothea superba* Loman, 1911:11–12, figs. 14–24.

*Achelia superba*.—Utinomi, 1971:328 [literature].—Nakamura and Child, 1983:12; 1991:6.—Nakamura, 1987:21–23, pls. 18, 36.

**MATERIAL EXAMINED.**—Aleutians, S of Amchitka Island, 51°17.8'N, 179°24.8'E, 229 m, R/V *Miller Freeman*, cruise 833, sta 24, 31 Jul 1983 (1 juv); Aleutians, Amchitka Island, Amchitka Pass, 51°39.6'N, 179°00.8'W, 428 m, R/V *Miller Freeman*, cruise 833, sta 37, 3 Aug 1983 (1 chelate subadult, 1 juv); Pribilof Islands, off St. Paul Island, 57°04'N, 170°18'W, 40 m, R/V *Miller Freeman*, cruise 888, sta Grab 7, 19 Sep 1988 (1♂, 1 juv).

**DISTRIBUTION.**—A northern Pacific Far East species with records from central Japan north to the Sakhalin Island of Russia, in a depth range of 7 to 300 m. These records place the species in the Aleutian Islands and the Pribilof Islands for the first time and in slightly deeper water of 428 m.

**DIAGNOSIS.**—Slightly similar to *A. borealis*, this species differs in a number of characters. Having longer more attenuated habitus with appendage lengths more like an *Ammothella* than an *Achelia*. Very long chelifore scapes, a long ocular tubercle, a long and erect abdomen, very long palps, ovigera, and legs with extremely attenuated and slender propodus, claw, and auxiliaries. Lateral processes and first coxae having small laterodistal tubercles and posterior 4 legs with a sex pore spur.

**REMARKS.**—The younger juvenile specimen of *Miller Freeman* sta 37 appears as though it is a new species, on first examination. Unlike the adult, it displays an extremely long

tubercle on each lateral process, with the largest longer than twice the segment diameter. Each tubercle is extremely slender, armed with tiny lateral spines and a very long seta at the tip of each tubercle. Posterolateral to each long lateral process tubercle is a shorter conical tubercle with a similar distal seta and there are similar tubercles lateral to the long ocular tubercle. The horizontal abdomen has two pairs of short tubercles also with distal setae. There are shorter tubercles with distal setae on each chelifore scape. Altogether, the specimen appears very different from an adult of the same species in which the tubercles are greatly reduced and much less conspicuous. The adult has several similarities to species of *Ammothella*, with its uncharacteristic (for *Achelia* species) long slender ocular tubercle and long elevated abdomen bearing long paired setae. Adults of this species, particularly males, are extremely setose and their legs are often wreathed in debris and hidden from view.

#### Genus *Eurycyde* Schioedte, 1857

Three new species of this genus have recently been described and two other previously unfigured species have been illustrated (Child, 1992:16, 18). Three additional new species are presented herein, bringing the total number of recognized species in this genus to 18. It is amazing to find three new species of this genus within a very small geographic area in the vicinity of one Arctic island. It is also surprising that none of the three species is very closely related to *E. hispida* Krøyer, the only other Arctic species known, a species that lacks any lateral process architecture such as tubercles or spines, but nevertheless has an ocular tubercle without spines or setae like the three *Eurycyde* described herein. Krøyer's species is known from localities in the eastern Canadian Arctic and from the western Russian Arctic suggesting that *E. hispida* may be the northern Atlantic counterpart of one or more of the following three northern Pacific species.

#### *Eurycyde arctica*, new species

FIGURES 3, 4G

**MATERIAL EXAMINED.**—Aleutians, S of Amchitka Island, 51°17.8'N, 179°24.8'E, 229 m, R/V *Miller Freeman*, cruise 833, sta 24, 31 Jul 1983 (1♀, paratype, USNM 234647). Aleutians, Amchitka Pass, 52°13.1'N, 179°43.7'W, 141 m, R/V *Halfmoon Bay*, cruise 801, sta 63, 27 Jul 1980 (1♂, holotype, USNM 234645, 1♂, paratype, USNM 234646).

**DISTRIBUTION.**—Known only from the vicinity of Amchitka Island in 141 to 229 m.

**DESCRIPTION.**—Species small, leg span about 9.5 mm. Trunk segments with slightly swollen posterior coxals without tubercles. Lateral processes moderately long, separated distally by at least half their diameters, armed with 1 dorsodistal slender tubercle with or without 1–2 tiny setae. Trunk anterior with

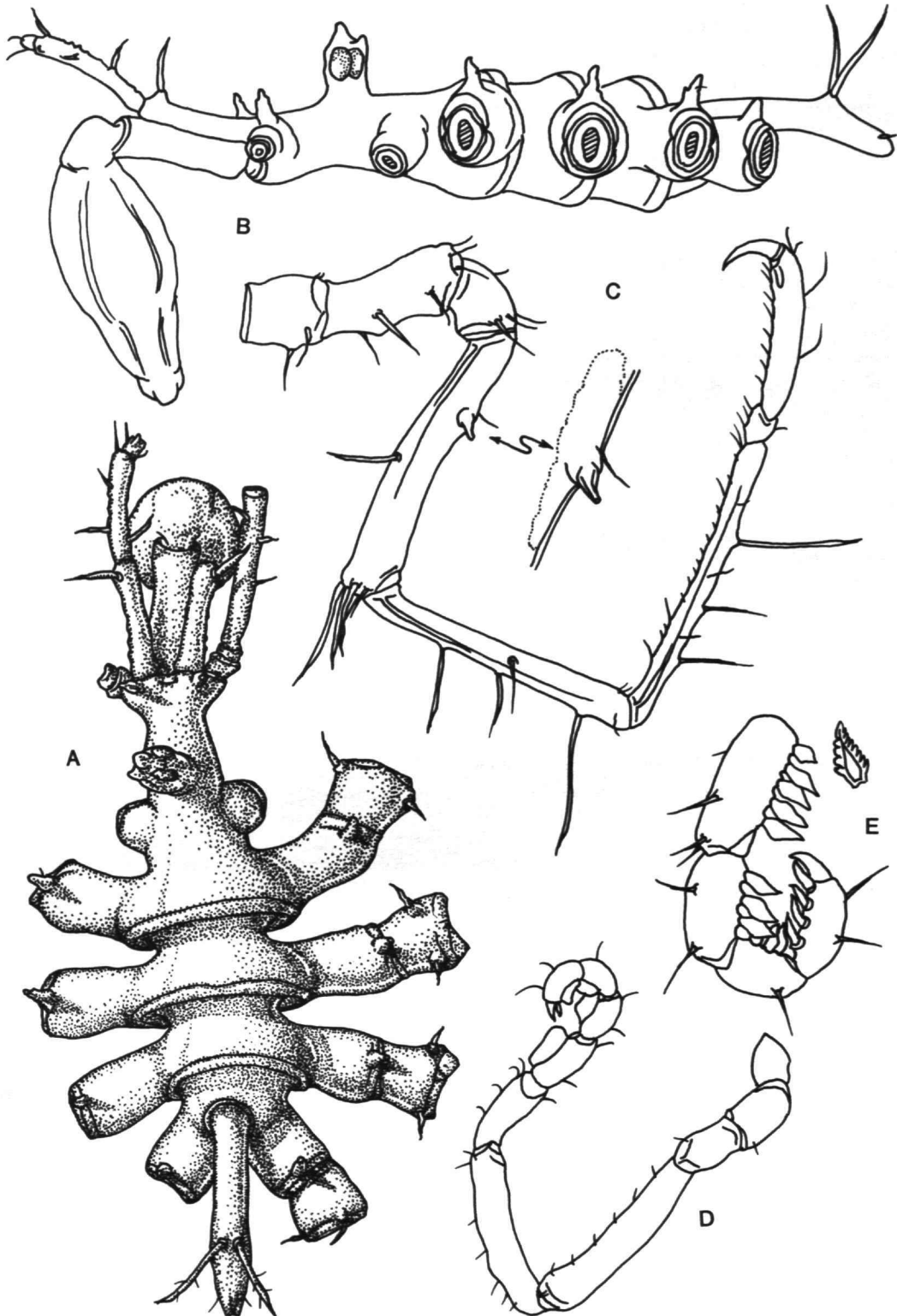


FIGURE 3.—*Eurycyde arctica*, new species, holotype male: A, trunk, dorsal view; B, trunk, lateral view; C, third leg, with enlargement of femoral cement gland; D, oviger; E, oviger strigilis, with enlarged spine.

pair of slender tubercles over chelifore insertion. Ocular tubercle a cylinder almost twice taller than its diameter, capped by small cone. Proboscis typical, second segment not greatly inflated. Abdomen long, carried horizontally, armed with pair of long dorsodistal spines and pair of short laterodistal setae.

Chelifores slender, short, scape first segment not quite as long as proboscis proximal petiole, second segment only slightly longer, both armed with moderately long spines; 1 on first scape segment, 3 on second segment along with 1 seta each and another seta on each atrophied chela. Palps typical, third segment slightly longer than fifth, distal 5 segments with fringe of ventral setae longer than their segments.

Ovigers typical, third segment slightly longer than fourth, both with few short lateral setae. Distal 4 segments (strigilis) with large denticulate spines having many lateral lobes, arranged in formula 5 : 3 : 3 : 4, with short terminal claw opposing enlarged spine, which imparts a chelate appearance.

Legs with very few long dorsal spines, none with feathered setules, all three major segments subequal in length. Propodus with few sole spines and claw slightly longer than typical, measuring about 0.33 propodal length. Femoral cement gland with low bulge having slender conical orifice on posteroventral femur in proximal half. Female legs with fewer long spines and small inconspicuous bulge in place of cement gland.

MEASUREMENTS (in mm).—Trunk length (chelifore insertion to tip 4th lateral processes), 1.51; trunk width (across 2nd lateral processes), 1.05; proboscis distal segment length, 0.95; abdomen length, 0.6; third leg lengths, coxa 1, 0.22; coxa 2, 0.44; coxa 3, 0.25; femur, 0.84; tibia 1, 0.84; tibia 2, 0.84; tarsus, 0.12; propodus, 0.5; claw, 0.17.

ETYMOLOGY.—The name for this species (Greek: *arktos*, the north) refers to its Arctic type locality.

REMARKS.—This species shares some characters with its Antarctic counterpart, *E. antarctica* Child, without suggesting that there could be any bipolar relationship. The two species look particularly close in lateral view. Both species have fairly long slender chelifores bearing few spines, moderately slender trunks with well separated lateral processes bearing small slender tubercles, long abdomina carried horizontally, and long relatively slender legs with few long spines.

Critical examination of most of these characters reveals morphological differences such as very different ocular tubercles (conical on *E. antarctica* and cylindrical on the new species), differences in chelifore spine counts (1 on the first scape segment of this species and 2 on that of *E. antarctica*) and relative differences in first scape segment lengths and that of the proboscis basal petioles (first scape segment shorter than petiole in the new species, longer than petiole in *E. antarctica*), long spines on abdomen of this new species and only short setae on the abdomen of *E. antarctica*, and long leg spines without setules in *E. arctica*, while some of the long spines in *E. antarctica* have setules. The first coxae of *E. arctica* have either two or a single stout spine arising from a small tubercle while the first coxae of *E. antarctica* are almost unique in this

genus in being glabrous. There are other minor differences in spination and appendage segment lengths between the two species, but the above comparisons should serve to differentiate the new species.

In spite of sharing many diagnostic characters, this new species has several differences from *E. platyspina* Stock. Stock's species has six long distal spines on its erect abdomen, many more long dorsal leg spines, all of which bear setules, much longer chelifore scapes that bear clubbed long spines bearing setules, first coxae with two conical dorsolateral tubercles each bearing a long basal spine (except for the fourth leg pair, which has only a single spine with two tubercles), and a lateral tubercle on the first palp segment rather than a tubercle dorsal to each chelifore insertion.

### *Eurycyde depressa*, new species

FIGURE 4A-F

MATERIAL EXAMINED.—Aleutians, off Semisopchnoi Island in eastern Rat Islands, 51°53.3'N, 179°45.6'E, 121 m, R/V *Lets Go*, cruise 861, sta 91, 7 Sep 1986 (1♂, holotype, USNM 234648).

DISTRIBUTION.—Known only from its type locality and depth.

DESCRIPTION.—Species very small, leg span only 7.4 mm. Trunk compact, circular in dorsal outline, segments without posterior inflation or ornamentation, glabrous. Lateral processes moderately long, closely spaced, armed with paired stout short dorsodistal spines on small tubercles, except for posterior lateral processes, which have single anterior spines. Small conical tubercles dorsal to chelifore insertions. Ocular tubercle very low, rounded, as wide as tall, eyes completely filling tubercle. Proboscis typical, rather short. Abdomen very short, extending only little beyond posterior lateral processes, carried horizontally, armed with pair of short dorsal spines and 2 lateral setae.

Palps segments short, third and fifth subequal in length, distal 5 segments short, little longer than fifth segment. Chelifores very short, first scape segment notably shorter than proboscis proximal petiole, second segment slightly longer, both armed with single dorsodistal spine, chelae stubs with single short setae. Oviger segments moderately short, fourth segment subequal to fifth, fifth with distal field of erect setae. Strigilis with denticulate spines having 5–6 lateral lobes per side, arranged in formula, 6 : 5 : 5 : 6, without larger terminal spine in opposition to short terminal claw. Terminal claw short, only as long as terminal segment diameter.

Leg main segments fairly short, femur longest segment with first tibia slightly longer than second tibia, all armed with very few short spines not as long as segment diameters except for single longer dorsodistal spine. Similar short spines on first coxae, 3 on anterior two pair and 4 on posterior two pair. Second coxae with 2 lateral spines and fringe of short ventrodistal setae, third coxae with single ventrodistal seta. No



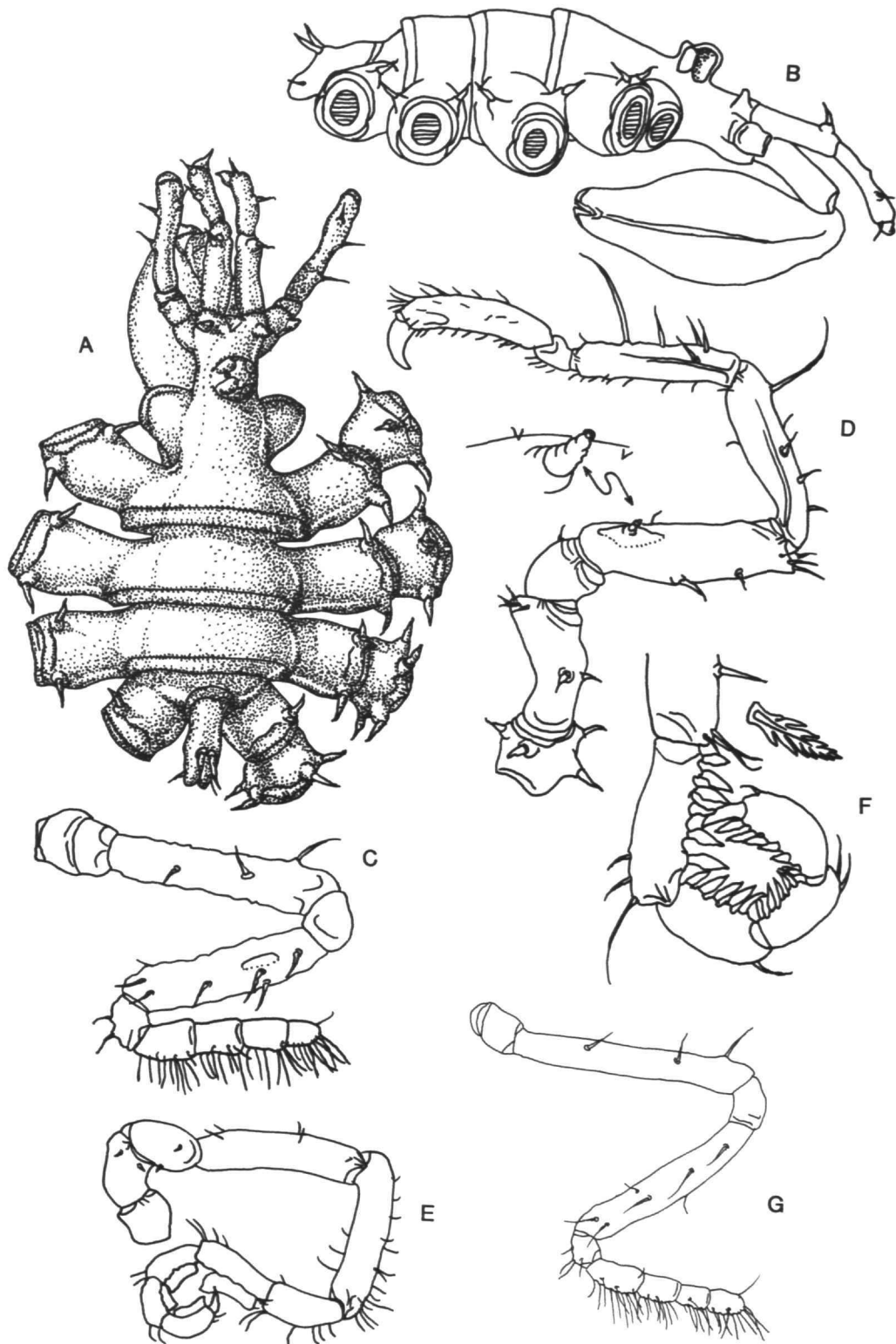


FIGURE 4.—*Eurycyde depressa*, new species, holotype male: A, trunk, dorsal view; B, trunk, lateral view; C, palp; D, third leg with enlargement of cement gland tube; E, oviger; F, oviger strigilis and denticulate spine, enlarged. *Eurycyde arctica*, G, palp, enlarged.

leg spines with setules. Femoral cement gland a very low proximal bulge placed laterally and having small short conical tube. Propodus moderately long, with 9–10 short sole spines and short robust claw.

Female characters unknown.

MEASUREMENTS (in mm).—Trunk length, 1.25; trunk width, 1.11; proboscis distal segment length, 1.52; abdomen length, 0.26; third leg lengths, coxa 1, 0.24; coxa 2, 0.38; coxa 3, 0.22; femur, 0.61; tibia 1, 0.53; tibia 2, 0.48; tarsus, 0.12; propodus, 0.44; claw, 0.14.

ETYMOLOGY.—The species name (Latin: *depressus*, meaning low, pressed down, depressed) refers to the depressed-appearing lateral profile.

REMARKS.—This flat-appearing species superficially resembles another rather flat species, *E. spinosa* Hilton. Child (1992:18, fig. 7) redescribed and illustrated Hilton's species, which had only been described preliminarily and not illustrated.

The species have a roughly circular dorsal outline, closely crowded lateral processes, very low ocular tubercles, extremely short abdomens, and very similar appendages. Differences between the two species appear in their setae, spines, and tubercles. Hilton's species has humped or swollen trunk segmentation ridges (flat in *E. depressa*) glabrous lateral processes (spinose in *E. depressa*), first coxae with large paired distal tubercles with a spine on the posterior tubercle (with 3–4 short spines and no large tubercles in the new species), 4 short spines on the low ocular tubercle (glabrous in this species) and at least 5 on the short abdomen (2 on the new species). The legs have more of the long dorsal spines, and all of these carry lateral setules (without setules in *E. depressa*). The species are otherwise similar.

### *Eurycyde muricata*, new species

FIGURE 5

MATERIAL EXAMINED.—Aleutians, W of Amchitka Island, 51°29.9' N, 178°39.6' E, 154 m, R/V *Lets Go*, cruise 861, sta 57, 18 Aug 1986 (1 juv, paratype, USNM 234650); Aleutians, off Kiska Island, 51°46.5' N, 177°22.7' E, 137 m, R/V *Lets Go*, cruise 861, sta 62, 20 Aug 1986 (1♀, holotype, USNM 234649).

DISTRIBUTION.—Known only from its type locality, south of the Rat Islands Group, in 137 to 154 m.

DESCRIPTION.—Leg span about 11 mm. Trunk long oval in dorsal view, segments swollen at their posteriors and bear dorsal and ventral fields of tiny setae at bulges. Lateral processes quite short, not longer than their diameters, armed with 3 stout spines not longer than segment diameters, spines arranged with pair dorsodistally and single largest spine in lateral process median. Second pair of lateral processes also with pair of small spines laterodistal to major spines. Fourth pair of lateral processes with single median spine only. Larger spines bear setules. Paired large spines like those of lateral

processes over insertion of chelifores. Ocular tubercle slender, tall, about 4 times taller than maximum diameter, eyes large, situated at rounded and glabrous tip. Proboscis typical, distal segment slender. Abdomen moderately long, erect, armed with 4 long spines in lateral array at midpoint bend, with 4 small laterodistal setae.

Chelifores moderately long, first scape segment longer than proboscis petiole, armed with lateral line of 4 long spines and 1 dorsodistally, second segment with dorsal and lateral lines of 4 long spines of varying length. Chelae stubs with single seta each. Palps typical, third segment longer than fifth, seventh segment slightly longer than subequal eighth and ninth, tenth a short stub. Distal five segments armed with many ventral setae longer than segment diameters. Ovigera (female) typical, strigilis segments armed with many-lobed denticulate spines in 2 rows with major spines in formula, 5 : 4 : 3 : 4, with larger denticulate spine in opposition to short terminal claw.

Legs moderately slender, long, major segments with many long spines some but not all "feathered" with setules. Second tibia longest segment with femur slightly shorter than first tibia, coxae with ventral fields of tiny setules. Propodus of typical shape and spination, many sole spines. Claw broad, short, about 0.3 of propodus length.

Male characters unknown.

MEASUREMENTS (in mm).—Trunk length (chelifore insertion to tips of 4th lateral processes), 1.78; trunk width (across 2nd lateral processes), 1.21; proboscis distal segment length, 1.1; abdomen length, 0.77; third leg lengths; coxa 1, 0.26; coxa 2, 0.37; coxa 3, 0.26; femur, 0.97; tibia 1, 0.98; tibia 2, 1.01; tarsus, 0.15; propodus, 0.67; claw, 0.23.

ETYMOLOGY.—The name (Latin: *muricatus*, meaning pointed or spiny like a murex shell) refers to the many robust dorsal spines of its lateral processes and first coxae.

REMARKS.—This species does not appear to be very similar to any other known species having a "bald" ocular tubercle and spines (articulated at base) or tubercles (not articulated) on the lateral processes. The species group with the above two characters, besides the three new *Eurycyde* discussed above, includes *E. acanthopus* Stock, *E. antarctica* Child, *E. curvata* Child, and *E. platyspina* Stock. None of the four species have stout spines on the lateral processes and first coxae as does *E. muricata*. Instead they have variously shaped tubercles with pointed or blunt tips on the lateral processes and armature of the first coxae usually very similar in size and shape as in *E. muricata*. The exception is in *E. platyspina* where the first coxae are very differently armed than the lateral processes. The latter have a single dorsodistal pointed tubercle whereas the first coxae bear stout laterodistal tubercles each with a long spine at its base.

Because the 18 known species currently forming this genus are very closely related in terms of appendage characters, it is necessary to use a different set of morphological traits to separate species. It appears as though lateral process and coxa embellishment are among the characters with sufficient

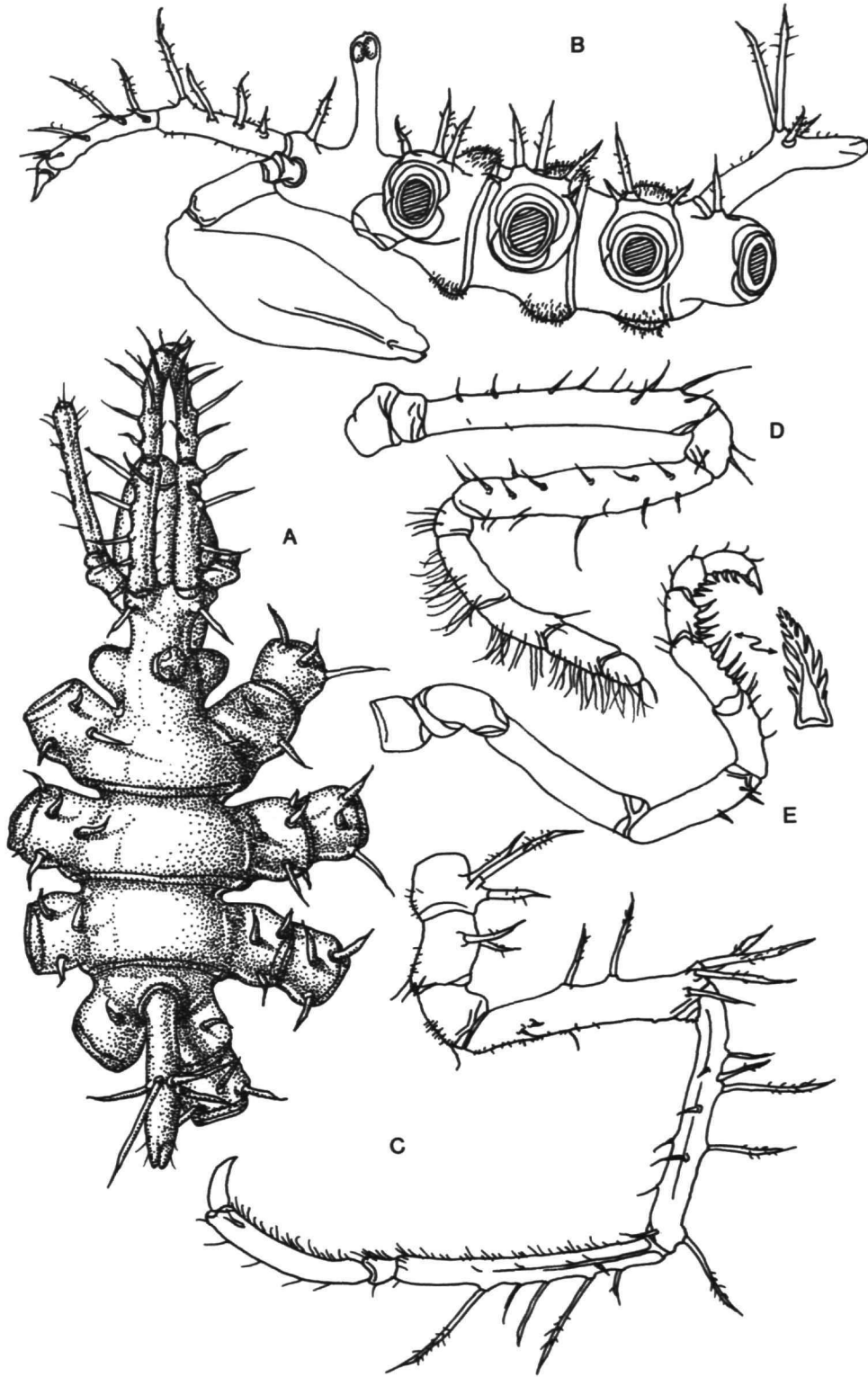


FIGURE 5. *Eurycyde muricata*, new species, holotype female: A, trunk, dorsal view; B, trunk, lateral view; C, third leg; D, palp; E, oviger with enlarged denticulate spine.

stability for this use. Trunk characters include length of the abdomen and its spination, ocular tubercle length and presence or absence of spines or setae, and perhaps the presence or absence of tubercles or spines dorsal to the chelifore insertion. The combination of all these characters is unique to *E. muricata*.

### Genus *Tanystylum* Miers, 1879

#### *Tanystylum grossifemorum* (Hilton)

*Ammothea grossifemora* Hilton, 1942g:96.

*Tanystylum anthomasthi* Hedgpeth, 1949:297–298, fig. 45.—Utinomi, 1954:23–26, figs. 10, 11, pl. 1: fig. 2; 1971:336–337.

*Tanystylum anthomasti*.—Hedgpeth, 1963:1339–1340, figs. 7, 10.

*Tanystylum grossifemorum*.—Nakamura and Child, 1991:25 [text].

**MATERIAL EXAMINED.**—Northern Bering Sea, St. Lawrence Island, E side, 64°00.5'N, 167°10.4'W, 29 m, R/V *Miller Freeman*, cruise 822, sta 73, 10 Sep 82 (1♀).

Gulf of Alaska, near Icy Cape, 59°50'N, 141°30'W, depth unknown, U.S. Revenue Cutter *Corwin*, 1884 (1, Hilton's type of *Ammothea grossifemora*, USNM 13601).

**DISTRIBUTION.**—Distribution is patchy across the North Pacific in a few scattered localities and it is known, for the most part, as a boreal species. It has been taken in northern Japan at Hokkaido, in the Alaskan Arctic Ocean at Point Barrow, and on the coast of Oregon at Coos Bay. The above record is relatively near Point Barrow and adds nothing new to its known depth range of 24 to 66 m.

**DIAGNOSIS.**—Tiny species, trunk only about 2 mm long, circular in dorsal aspect, lateral processes contiguous with cephalic segment extending slightly beyond circle, ocular tubercle a low cone. Proboscis long, tapering to rounded mouth. Chelifore scapes short, chelae atrophied. Palps very short, 7-segmented. Legs short, robust, with heavily setose integument, femora inflated, larger in females than males. Male second coxae with ventrodorsal sexual spur and femora with dorsodistal tubercle. Ovigera and terminal leg segments typical for genus.

**REMARKS.**—Hilton's (1942g:46) type was so poorly described that it could not be identified with any certainty from the short description given. The species was subsequently and correctly described in the genus *Tanystylum*, but under another specific name, which now becomes a synonym.

The species is easily recognized, at least in the Bering Sea, as it is the only known member of the genus in that area. The species was never taken in Aleutian Island stations listed in this report, though it occurs to the north and south of the Islands, and would be expected to occur among specimens of *Achelia* taken in shallow localities, but has not been taken so far in that situation.

### Family PYCNOGONIDAE Wilson

#### Genus *Pycnogonum* Brunnich, 1764

#### *Pycnogonum stylidium*, new species

FIGURE 6

**MATERIAL EXAMINED.**—Aleutians, S of Amchitka Island, 51°17.8' N, 179°24.8'E, 229 m, R/V *Miller Freeman*, cruise 833, sta 24, 31 Jul 83 (1♂, holotype, USNM 234651).

**DISTRIBUTION.**—Known only from the type locality.

**DESCRIPTION.**—Species quite small, leg span about 12.8 mm. Trunk compact, tapering to narrow fourth segment, armed with low rounded mediandorsal tubercles on swollen posterior segment rims, with extra tubercle not as tall as others between the ocular tubercle and the posterior cephalic segment tubercle. Lateral processes very short, not as long as their widths, with single low rounded dorsodistal tubercle each, without spines or setae. Ocular tubercle very low, not as tall as mediandorsal tubercles on segment rims, slightly taller than nearest median-dorsal tubercle, flat-topped, eyes filling tubercle, well pigmented.

Proboscis moderately short, half trunk length, truncate cone with slightly concave sides, narrow oral surface flat. Abdomen a square tipped cylinder in lateral view, tapering distally in dorsal view, tip rounded, half as long as proboscis, glabrous.

Ovigera tiny in comparison with others of the genus, 8-segmented, a string of cylindrical segments of varying short lengths. Third segment with 2–3 short lateral spines, terminal claw not quite as long as terminal segment, very slightly curved, blunt tipped.

Legs short, robust, having very few tiny dorsal and ventral spines on coxae and tibiae, dorsodistal spine not as long as segment diameters of major leg segments. First coxae with paired dorsodistal bulges, no coxa longer than its diameter. Femur with large proximoventral bulge, slightly smaller dorsodistal bulge with additional distal bulge bearing spine. Tibiae with rough uneven dorsal surfaces bearing few tiny spinules. Tarsus, propodus with fields of crowded short sole spines, propodus with few short dorsal and lateral spines. Claw robust, moderately curved, with very short tiny auxiliary claws about equal in length to propodus dorsal spines. Sexual pores appear faintly on second coxae of both fourth legs.

Female characters unknown.

**MEASUREMENTS** (in mm).—Trunk length (anterior rim to tip 4th lateral processes), 3.24; trunk width (2nd lateral processes), 2.28; proboscis length (laterally), 1.68; abdomen length, 0.86; third leg, coxa 1, 0.52; coxa 2, 0.49; coxa 3, 0.48; femur, 0.95; tibia 1, 0.82; tibia 2, 0.62; tarsus, 0.28; propodus, 0.78; claw, 0.31.

**ETYMOLOGY.**—The species name (Greek: diminutive of

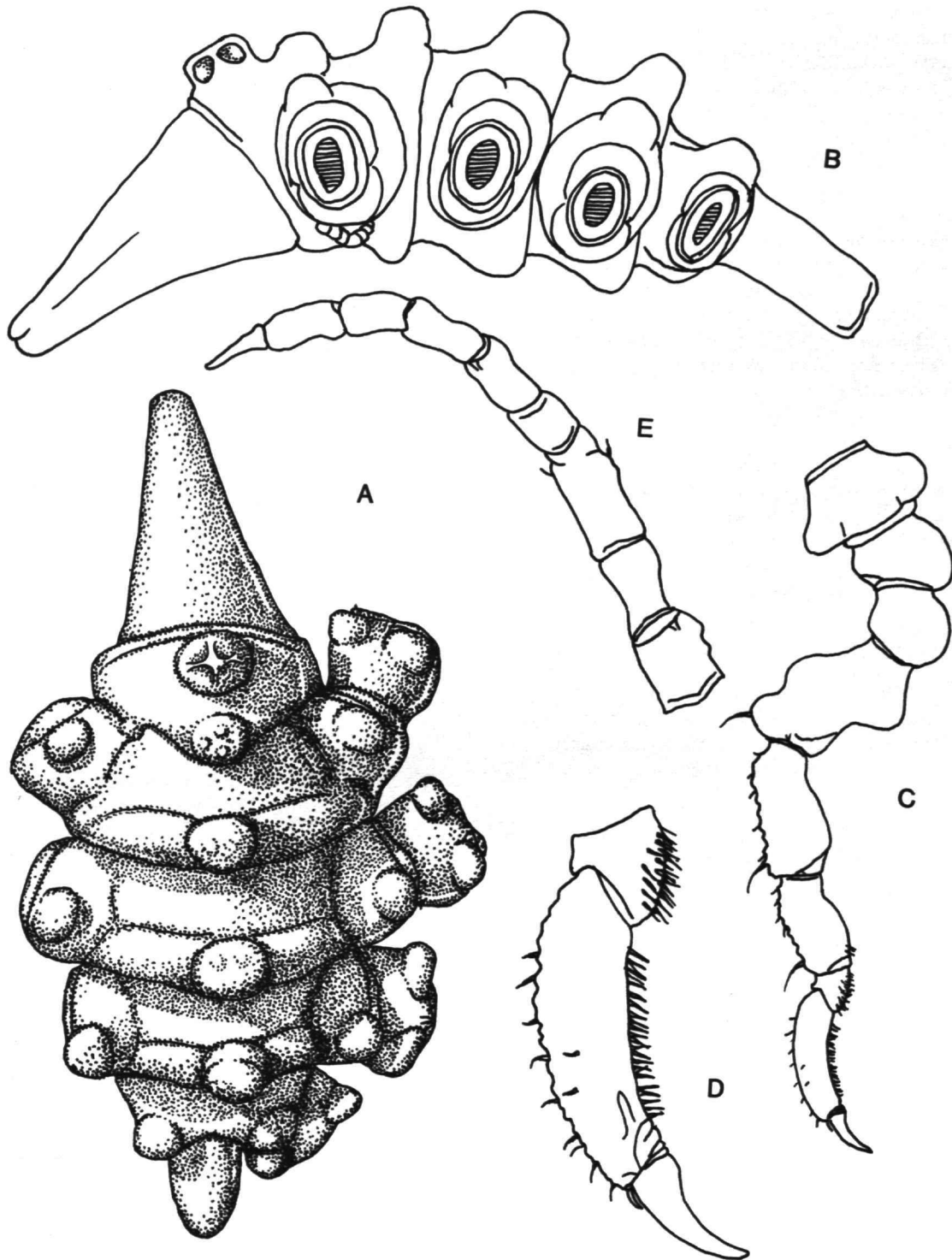


FIGURE 6.—*Pycnogonum stylidium*, new species, holotype male: A, trunk, dorsal view; B, trunk, lateral view; C, third leg; D, propodus, enlarged; E, oviger.



*stylos*, meaning a pillar or post) refers to its truncate dorsomedian and ocular tubercles.

REMARKS.—A conical proboscis with concave sides and tapering to a very narrow oral surface is uncommon among species of this genus. No other northern Pacific species has such an acutely conical proboscis. Specimens of the otherwise very similar North Pacific species, *P. uedai* Nakamura and Child, were examined for comparison. The proboscis of that species (in the six specimens examined, plus the type, and figures of *P. koreanum* Kim and Stock, a synonym of *P. uedai*) is always barrel-shaped but sometimes narrower and sometimes fatter or more inflated. It is never narrowly tapered or conical with a relatively tiny mouth as in this species.

Stock's *P. crosnieri* (1991:206–208, fig. 56) is an example of a species, among several, with an additional dorsomedian tubercle just posterior to the ocular tubercle, but its proboscis is rounded distally and nothing like that of this new species. Stock's species also lacks ovigers. Another species with a second low tubercle behind the ocular tubercle is *P. asiaticum* Müller, which also has a very low truncate ocular tubercle, but a very much shorter proboscis, which is barrel-shaped. Müller's species also has other characters that separate it readily from this new species.

The oviger of this new species is extremely narrow and tiny in a genus with tiny ovigers. This male is apparently an adult, as the sexual pores are present, if faintly, on the second coxae, fourth leg pair.

There is no known species with the combined characters of severely conical proboscis, two low middorsal trunk bosses or knobs on the cephalic segment, dorsal and ventral tubercles on the femora, tiny auxiliary claws, and extremely slender ovigers of eight segments.

### *Pycnogonum tenue* Slater

*Pycnogonum littorale* var. *tenue* Slater, 1879:281–283.

*Pycnogonum tenue*.—Hedgpeth, 1949:303, figs. 48b, 50c.—Nakamura and Child, 1991:63 [literature].

MATERIAL EXAMINED.—Aleutians, off Amchitka Island, 51°14.5'N, 179°11.8'E, 241 m, R/V *Lets Go*, cruise 861, sta 52, 17 Aug 86 (1♂); Aleutians, off Kiska Island, 52°03.9'N, 177°13.8'E, 93 m, R/V *Lets Go*, cruise 861, sta 79, 28 Aug 86 (2 juv, 2 larvae).

DISTRIBUTION.—Taken in many localities in Japan in the broad depth range of 7 to 416 m and thought to be endemic, the above two records extend distribution of this species to the western Aleutian Islands, but from previously known depths.

DIAGNOSIS.—Trunk and appendage integument lightly reticulated or sometimes unreticulated but granular. Trunk with slender dorsomedian tubercles, rounded or pointed. Lateral processes slightly longer than diameter, closely spaced but separated distally, with low dorsodistal bulges sometimes becoming a continuous dorsal ridge. Proboscis a long tapering truncate cone with flat oral surface. Abdomen fairly long,

slender, tapering distally, extending beyond distal rim of first coxae, fourth legs.

Oviger 9-segmented, of moderate size, terminal claw slightly curved. Legs with moderately slender major segments, with very few short spines. Propodus tapers distally to smaller diameter, sole with pile of short spines, claw robust, long, more than half length of propodus, auxiliary claws lacking.

REMARKS.—This is the most commonly taken *Pycnogonum* in Japan and is approximately the same size as the following species, which lacks dorsomedian trunk tubercles and has a much shorter barrel-shaped proboscis.

### *Pycnogonum ungelatum* Loman

*Pycnogonum ungelatum* Loman, 1911:7–8, pl. 2: figs. 25–27.—Hedgpeth, 1949:304, figs. 48c, 50e–g.—Utinomi, 1971:339 [literature].—Nakamura and Child, 1983:66.

MATERIAL EXAMINED.—Aleutians, off Semisopchnoi Island, 51°53.3'N, 179°45.6'E, 121 m, R/V *Lets Go*, cruise 861, sta 91, 7 Sep 86 (1♂, 1 juv).

Aleutians, off Little Tanaga Islands, 51°36.3'N, 176°22.2'W, 274 m, R/V *Miller Freeman*, cruise 833, sta 87, 12 Aug 83 (1♀).

Aleutians, off Amchitka Island, 52°03.4'N, 179°25.1'E, 174 m, R/V *Halfmoon Bay*, cruise 801, sta 70, 29 Jul 80 (2♂ with eggs, 1♂, 3♀, 1 larva).

DISTRIBUTION.—Known from the Sea of Okhotsk, the east side of Sakhalin Island in the Pacific, and localities as far south as Sagami Bay in Japan, with a known depth range of 7 to 419 m. The new records move its known distribution into the western Aleutian Islands, but within the known depth range.

DIAGNOSIS.—A small species with trunk length of only 8.5 to 9.0 mm. Trunk of adult without conspicuous dorsomedian tubercles, present and more conspicuous in juveniles, lateral processes closely crowded, almost touching, without adornment. Proboscis barrel-shaped, tapering distally, only as long as anterior 2 trunk segments. Abdomen short, squared at tip in dorsal view.

Ovigers 9-segmented, very small. Legs moderately short, robust.

REMARKS.—Hedgpeth (1949:304) compared this species with *P. stearnsi* Ives, which is found frequently along the California coast. It shares the same general trunk habitus except that the lateral processes of *P. stearnsi* are slightly further apart, both species have similar legs, and the abdomens of both species are the same length although that of *P. ungelatum* has a squared tip. Differences are represented in the proboscis of *P. stearnsi*, which does not taper distally but is inflated toward its tip and narrower at its proximal end, and in conspicuous dorsomedian trunk tubercles of *P. stearnsi*, which are lacking in *P. ungelatum* adults.

### *Pycnogonum* species indeterminate

MATERIAL EXAMINED.—Aleutians, off Attu Island,

52°32.6'N, 172°57.9'E, 137 m, R/V *Lets Go*, cruise 861, sta 72, 24 Aug 86 (1 larva).

REMARKS.—The tiny specimen is much too young for accurate determination.

### Family CALLIPALLENIDAE Hilton

#### Genus *Pseudopallene* Wilson, 1878

##### *Pseudopallene circularis* (Goodsir)

*Pallene circularis* Goodsir, 1842:136, 5 figures.

*Pseudopallene circularis* Sars, 1891:38–42, pl. 3: fig. 3.—Hedgpath, 1963:1333–1334 [literature].

*Cordylochele microspines* Hilton, 1942c:39–40 [new synonymy].

*Cordylochele setospines* Hilton, 1942c:39 [new synonymy].

*Pseudopallene setosa* Hilton, 1942c:39 [new synonymy].

*Pseudopallene spinosa* Hilton, 1942c:39 [new synonymy].

MATERIAL EXAMINED.—Commander Islands, Bering Island, 11 km off Cape Monati, 54°36'15"N, 166°57'15"E, 132 m, R/V *Albatross*, sta 4792, 14 Jun 1906 (1♀).

Aleutians, W of Amchitka Island, 51°29.9'N, 178°39.6'E, 154 m, R/V *Lets Go*, cruise 861, sta 57, 18 Aug 86 (3 spec.); Aleutians, off Kiska Island, 51°46.5'N, 177°22.7'E, 137 m, R/V *Lets Go*, cruise 861, sta 62, 20 Aug 86 (2 spec.); Aleutians, E of Semisopochnoi Island, 52°10.8'N, 179°51.2'W, 165 m, R/V *Lets Go*, cruise 861, sta 99, 8 Sep 86 (2 spec.); same location, 52°07.9'N, 179°55.5'W, 135 m, R/V *Lets Go*, cruise 861, sta 100, 8 Sep 86 (1 spec.).

Aleutians, off Little Tanaga Islands, 51°36.3'N, 176°22.2'W, 274 m, R/V *Miller Freeman*, cruise 833, sta 87, 12 Aug 83 (1 spec.).

Pribilof Islands, W of St. Matthew Island, 60°21'N, 172°02'W, 59 m, R/V *Paragon II*, cruise 791, sta 247, 22 Jul 79 (1 spec.).

DISTRIBUTION.—Taken previously in the Bering Sea and Aleutians and widely distributed in relatively shallow waters from the Russian Far East, Alaska, western and eastern Canada, and extending to many places in the European Arctic, the species is probably panarctic.

DIAGNOSIS.—An extremely spiny species. Trunk compact, oval in dorsal outline, with several short dorsomedian spines sometimes on tubercles. Lateral processes closely spaced, sometimes touching, armed with short dorsolateral spines distally and sometimes also a short proximal spine. Cephalic segment with several low tubercles with setae anterior to low ocular tubercle. Proboscis very short, a cylinder proximally, rounded distally with a very small oral surface usually fringed with short spines. Abdomen moderately long, carried horizontally.

Chelifores massive, scapes cylindrical. Chelae oval, fingers very short, immovable finger bearing tubercle in opposition to movable finger. Palps lacking. Ovipiger 10-segmented. Legs robust, very spiny, propodus and claw short, auxiliaries lacking.

REMARKS.—A common boreal species appearing in most

reports of that fauna. Hilton could not establish a single species for all of his Alaskan specimens and he therefore erected four different species while not recognizing that all four belonged to *P. circularis*. He did not list *P. circularis* among his Alaskan specimens. This species is variable in its dorsomedian spines and chelifore characters. Hilton could have been misled by this variability, and more than one of his new species listed above is a juvenile.

#### Genus *Pallenopsis* Wilson, 1881

##### Subgenus *Bathypallenopsis* Stock, 1975

##### *Pallenopsis (Bathypallenopsis) pacifica* Hilton

Figure 7

*Pallenopsis pacifica* Hilton, 1942c:40.

*Pallenopsis stschapovae* Turpaeva, 1957:356–358, fig. 1 [new synonymy].

*Pallenopsis (Bathypallenopsis) stschapovae*.—Stock, 1975:1032 [list; new synonymy].

MATERIAL EXAMINED.—Aleutians, N of Amchitka Island, 54°33'N, 178 44'E, 1068 m, R/V *Albatross*, sta 4775, 4 Jun 1906 (1♀, holotype, USNM 81515).

DISTRIBUTION.—Distributed from the Russian northern Pacific to the western Aleutians. Depth range for the known specimens is an amazing 1068 m for the type, and 0 to 5500 m plus 7280 m for Turpaeva's two specimens. The latter is the deepest record for any known pycnogonid.

DIAGNOSIS.—Small for a member of the subgenus, leg span only about 47.6 mm. Species of *tydemani*-group. Proboscis tip very slightly swollen or not swollen at all. Trunk glabrous, lateral processes separated by about their diameters, less than twice as long as diameters. Abdomen moderately short, erect, tip rounded.

Chelifore scapes subequal or second segment slightly shorter. Chelae with typical long well curved fingers, some with serrated cutting edge. Ovipiger (male) second and fifth segments subequal, fourth slightly shorter, terminal segments with few randomly placed setae per segment. Legs increasingly setose/spinose distally, setae mostly shorter than segment they are on, some spines bearing tiny lateral spinules. Second tibiae the longest segments. Propodus with few widely spaced sole spines, 2 or 3 larger heel spines, very robust main claw and slender auxiliary claws only little longer than main claw diameter.

MEASUREMENTS (of Hilton's female type specimen, in mm).—Trunk length, 4.33; trunk width (across second lateral processes), 2.13; proboscis length, 2.94; abdomen length, 1.14; third leg segments, coxa 1, 0.7; coxa 2, 2.22; coxa 3, 1.06; femur, 5.52; tibia 1, 5.17; tibia 2, 6.1; tarsus, 0.18; propodus, 1.04; claw, 0.74.

REMARKS.—The characters mentioned by Hilton were accurately portrayed but he had little taxonomic concept of which characters were diagnostic and which were incidental and shared by almost all species of the same genus.

This is one of the smallest species of a subgenus containing

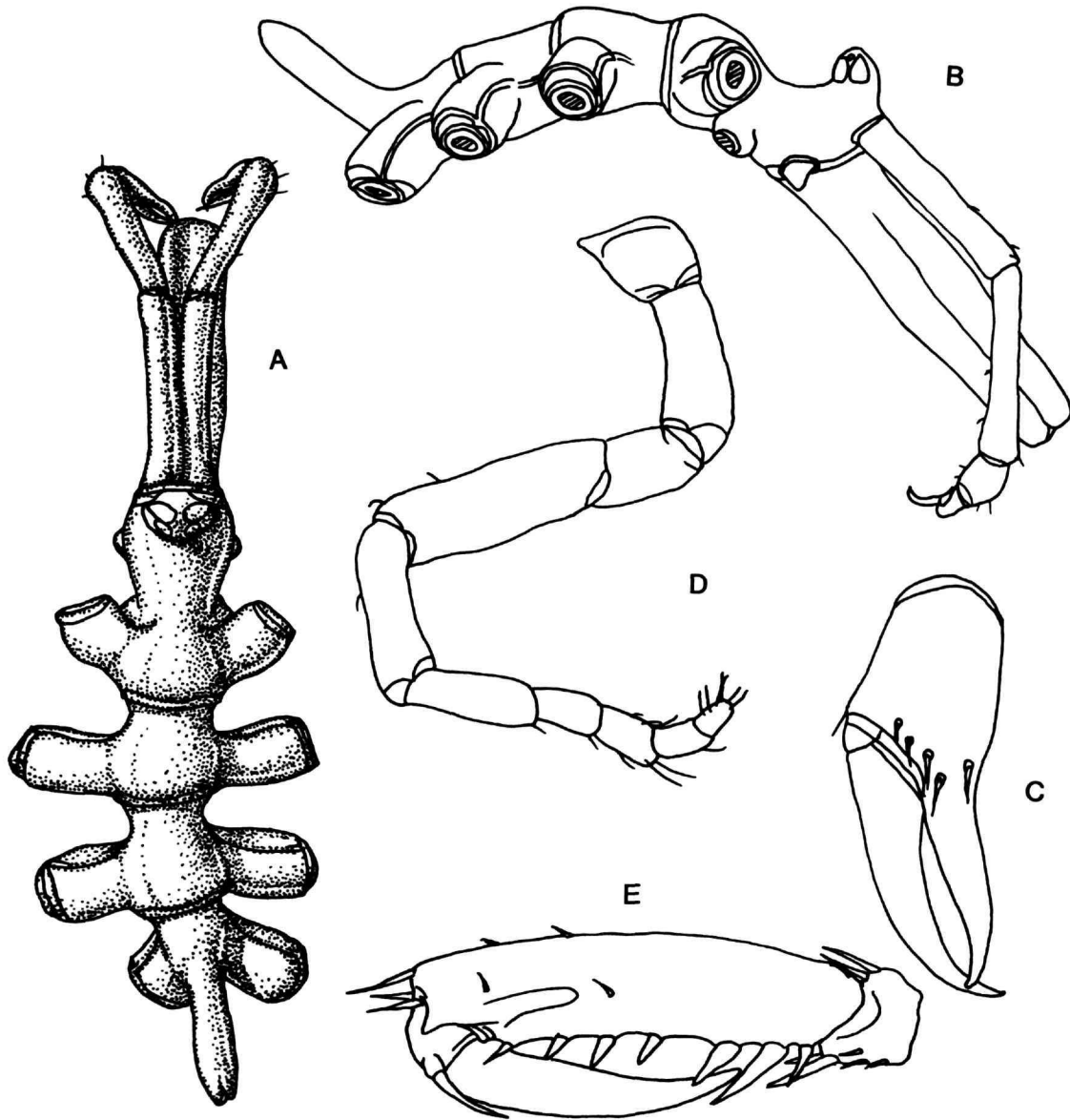


FIGURE 7.—*Pallenopsis (Bathypallenopsis) pacifica* Hilton, holotype female: A, trunk, dorsal view; B, trunk, lateral view; C, chela; D, oviger; E, distal leg segments.

a large number of large species. It has few distinguishing characters to separate it from other small species of this closely related subgenus. It is a species of the *tydemani*-group in which the proboscis, although swollen medially, is not expanded at all distally or else it has a very slight inflation.

Examination of Turpaeva's figures of her *P. stschapovae* convinces me that Hilton's and Turpaeva's species are conspecific in spite of the few differences. Differences lie in the chelae fingers of Turpaeva's species, which apparently bear serrated cutting edges, the proboscis, which has a small distal

swelling, the auxiliary claws, which are longer, and in the leg spines, which have spinules on their lateral surfaces, all of which could be considered insignificant in light of the great variation shown by many pycnogonid species. The two species are sufficiently close to be considered the same species. Turpaeva's figures are of a male whereas Hilton's specimen is a female, but there are no conspicuous differences. The few differences are found in chelae fingers, which lack serrations in Hilton's specimen, auxiliary claws, which are slightly smaller, and the many leg setae are almost devoid of lateral spinules,

although there appear to be some few tiny ones on the large setae of the tibiae. There is an additional specimen of this species from the mid-Pacific in the National Museum collections. Comparison of this specimen with Hilton's type and Turpaeva's figures suggests that they are all the same species.

The only great difference is the maximum depth of Turpaeva's species at 7280 m, compared to Hilton's specimen depth of 1068 m. This depth discrepancy is far from unique among the pycnogonids.

*Pallenopsis (Bathypallenopsis) profundis* Hilton was reported by Hedgpeth (1949:280 (text)) to have been taken in the Bering Sea. The latitude/longitude given on its label (and by Hilton, 1942c:40–41) place it in British Columbia, off Queen Charlotte Island in a depth of 2904 m. Evidently, two different stations were given on the label for this species and the error was only recently corrected. *Pallenopsis (B.) profundis* belongs to the *tydmani*-group, but is considerably larger than the present species. It will not be described in this paper as no new material was taken in the Bering Sea or the Aleutians for inclusion here.

#### Family PHOXICHILIDIIDAE Sars

##### Genus *Phoxichilidium* Milne-Edwards, 1840

##### *Phoxichilidium ungelatum* Hedgpeth

*Phoxichilidium ungelatum* Hedgpeth, 1949:281–283, fig. 38.—Stock, 1954:71.—Utinomi, 1955:22, fig. 12; 1971:325.—Nakamura and Child, 1991:34–35.

MATERIAL EXAMINED.—Aleutians, off Kiska Island, 52°02.9'N, 177°13.8'E, 93 m, R/V *Lets Go*, cruise 861, sta 79, 28 Aug 86 (1♂).

Aleutians, off Little Tanaga Islands, 51°36.3'N, 176°22.2'W, 274 m, R/V *Miller Freeman*, cruise 833, sta 87, 12 Aug 83 (1♀).

DISTRIBUTION.—Known previously as an endemic from many localities around the Japanese Islands. The two Aleutian specimens greatly extend its distribution to the western Aleutian Islands but add nothing to a wide depth range of 0 to 479 m.

DIAGNOSIS.—A long and slender species in a genus of usually compact species. Trunk glabrous, segmentation lines complete, lateral processes well separated. Ocular tubercle low, rounded, eyes well pigmented. Abdomen short, erect.

Chelifore scapes long, slender. Chelae small, fingers well curved, about as long as small palm. Palp buds lacking. Ovigera very long, 5-segmented, few short lateral setae. Legs very long, slender, dorsal cement gland pores along most of femur length. Propodus long, well curved, 3 heel spines, very long well curved claw, and ectal auxiliaries little longer than main claw maximum diameter.

REMARKS.—Stock (1991:202) limits the species in this genus to those seven species bearing well developed auxiliary claws situated on the dorsal (ectal) side of the main propodal

claw rather than lateral auxiliaries. It is very difficult otherwise to differentiate species of this genus from the look-alike and much more widespread species of *Anoplodactylus*. I concur with his separation. Hedgpeth's species has the ectal auxiliaries to conform to this definition of the genus, and can be separated from other species by its very long ovigera of 5 segments, long legs with 3 heel spines, chela fingers without teeth, and its many femoral cement gland pores.

#### Family NYMPHONIDAE Wilson

##### Genus *Heteronymphon* Gordon, 1932

##### *Heteronymphon horikoshii* Nakamura

*Heteronymphon horikoshii* Nakamura, 1985:31–34, fig. 2.—Nakamura and Child, 1991:43.

MATERIAL EXAMINED.—Aleutians, Fox Islands, N of Unalaska Island, 54°28.05'N, 166°32.85'W, 530 m, R/V *Miller Freeman*, cruise 888, sta 143, 6 Sep. 1988, trawl (1♀).

DISTRIBUTION.—Known from a single male type taken in 700 to 732 m in northern Honshu Island, Japan, and another specimen, a female, taken in almost the same locality, but in 2000 m. This record is the third known specimen and extends considerably its geographic distribution into arctic waters and to a slightly shallower depth.

DIAGNOSIS.—A slender, attenuated species. Lateral processes separated proximally by less than twice their diameters. Ocular tubercle a broad cone as tall as wide, situated at anterior of cephalic segment. Anterior eye pair much larger than posterior pair. Proboscis slender, only about as long as cephalic segment. Abdomen slender, not longer than posterior lateral process pair.

Chelifore scapes equal in length to proboscis, chelae slender, fingers almost equal in length to palm, armed with 18 to 23 small teeth. Palp third segment longest, fourth longer than fifth. Legs very slender, second tibiae very long, first tibiae longer than femora. Propodus only slightly longer than tarsus.

REMARKS.—This female has all the characters of the male type but some of these vary to a greater or lesser degree. The ocular tubercle of this specimen is canted slightly anteriorly, has huge eyes, even larger than those of the male, apparently filling the low ocular tubercle, and bears a small apical cone on the anterior side of the tubercle. The palp segments are proportional to those of the male except for the two terminal segments that are subequal in length rather than of unequal lengths as in the type. The chelae fingers bear a slightly greater number of teeth in the female and the teeth are longer than those of Nakamura's figure 2c.

The ovigera of this female display the usual reduction of segment lengths between sexes, as in *Nymphon*, particularly in the fifth segment, but the ovigera of this female is apparently that of a young specimen because the denticulate spine count is only about half that of the adult male type, which is 8 : 7 : 7 : 9.

The legs of the female agree in most length ratios except for that of the tarsus/propodus where the tarsus is only slightly longer than half the propodal length (32/60). I do not consider the sum total of these differences to warrant the designation of a new species, but only regard them as evidences of variation particularly common in this family.

### Genus *Nymphon* Fabricius, 1794

There are eight additional *Nymphon* species besides those that form part of this report that were named and described in a preliminary way by W.A. Hilton (1942a:3-7) from the area under study. No additional specimens of these species were collected during the Bering Sea Program, but to complete the list of species described by Hilton from the Aleutians, and to clarify Hilton's sometimes confused and incorrect localities for the record, they will be listed with their synonymy and corrected type locality below. These species were mentioned by Hedgpeth (1949) in his excellent Japanese paper and will not be discussed or described in this report.

Hilton's additional species:

#### *Nymphon basispinosum* Hilton

*Nymphon basispinosum* Hilton, 1942a:5.—Hedgpeth, 1949:273, fig. 34e.

**Material.**—Commander Islands, off Bering Island, 54°50'24"N, 167°13'00"E, 104 m, R/V *Albatross*, sta 4788, 14 Jan 1906 (1♂ with eggs, holotype, USNM 81507).

#### *Nymphon brevirostre* Hodge

*Nymphon microcollis* Hilton, 1942a:5.—Hedgpeth, 1949:273, fig. 34d.

**Material.**—Bering Sea, specific locality unknown, coll. U.S. Revenue Cutter *Corwin*, 1885 (1♀, holotype, USNM 81506).

#### *Nymphon duospinum* (Hilton)

*Chaetonymphon duospinum* Hilton, 1942a:6.—Hedgpeth, 1949:274, fig. 331.  
*Chaetonymphon quadrispinum* Hilton, 1942a:7.—Hedgpeth, 1949:274, fig. 33m.

**MATERIAL.**—Aleutians, Kiska Island, Kiska Harbor, coll. W.H. Dall, sta (1036), 1873 (1♀, holotype, USNM 13354, *C. duospinum*).

Aleutians, same locality and collector, sta (1035), 1873 (1♀, holotype, USNM 13353, *C. quadrispinum*).

#### *Nymphon elongatum* Hilton

*Nymphon elongatum* Hilton, 1942a:5.—Hedgpeth, 1949:273, fig. 34f.

**MATERIAL.**—Aleutians, Unalaska Island, NE of Dutch Harbor, 54°36'15"N, 166°57'15"W, 132 m, R/V *Albatross*, sta 4792, 14 Jun 1906 (1♂, 2♀, syntypes, USNM 81508).

#### *Nymphon molum* Hilton

*Nymphon molum* Hilton, 1942a:4.—Hedgpeth, 1949:271, fig. 34a.

**MATERIAL.**—Bering Sea, Pribilof Islands, 57°06'N,

170°35'W, 75 m, R/V *Albatross*, sta 3439, 3 Aug 1891 (1♂ with eggs, holotype, USNM 81503).

#### *Nymphon profundum* Hilton

*Nymphon profundum* Hilton, 1942a:3.—Hedgpeth, 1949:270-271, fig. 33a-f.  
*Nymphon noctum* Hilton, 1942a:3.—Hedgpeth, 1949:271, fig. 33g-k.

**MATERIAL.**—Aleutians, Koniuji Island, off Atka Island, 52°38'N, 174°49'W, 3248 m, R/V *Albatross*, sta 4766, 31 May 1906 (1♀, holotype, USNM 81500, *N. profundum*). Southeast Alaska, off Alexander Archipelago, 55°20'N, 136°20'W, 2869 m, R/V *Albatross*, sta 2859, 29 Aug 1888 (1♂ with eggs, holotype, USNM 81501, 41 spec., paratypes, USNM 81502, *N. noctum*).

#### *Nymphon brevitarso* Krøyer

*Nymphon brevitarso* Krøyer, 1838.—Hedgpeth, 1963:1328-1329 [literature].

**MATERIAL EXAMINED.**—Aleutians, Amchitka Pass, 51°42.9'N, 178°51.5'W, 582 m, R/V *Miller Freeman*, cruise 833, sta 38, 3 Aug 83 (1♀); Aleutians, off Little Tanaga Islands, 52°02.1'N, 176°22.6'W, 249 m, R/V *Miller Freeman*, cruise 833, sta 56, 6 Aug 83 (2 juv, probably this species).

**DISTRIBUTION.**—Distributed around the rim of the Arctic Ocean, reported from the Russian Arctic, Bering Sea, northern Alaska, Canadian Arctic, Greenland, and Spitsbergen, from shallow depths to more than 500 m.

**DIAGNOSIS.**—Trunk robust, lateral processes short, little longer than diameters, separated by less than diameters, with few short posterodistal setae. Ocular tubercle very low, eyes filling most of tubercle. Proboscis short, cylindrical, oral surface rounded. Abdomen moderately short, erect.

Chelifore scapes robust, slightly curved, chelae palms robust, fingers shorter than palm, with small short teeth. Palps quite short, second segment only about 3 times longer than its width, distal segments each shorter. Legs moderately long, with many short setae and spines, few longer than segment diameters. Tarsus almost as long as propodus. Propodus with 5 larger sole spines, several smaller distal spines. Auxiliary claws little less than half main claw length. Appendages show much variability.

**REMARKS.**—Hedgpeth (1963:1328-1329) emphasized that this species is difficult to pin down due to all of the varieties, forms and subspecies attributed to it. It probably will be given additional synonymies as more authors find and describe specimens. The best of the few figures of this species are those of Sars, 1891 (pl. 5: figs. 1, 3, as *N. gracile* and *N. brevitarso*).

#### *Nymphon bergi* Losina-Losinsky

*Nymphon bergi* Losina-Losinsky, 1961:72-74, fig. 7.

**MATERIAL EXAMINED.**—Aleutians, off Semisopochnoi Island, 52°14.9'N, 179°39.2'W, 388 m, R/V *Lets Go*, cruise 861, sta 98, 8 Sep 86 (1♀).

**DISTRIBUTION.**—The type female was taken from Russian far eastern waters in 291 m. This second recorded specimen



extends its distribution to the western Aleutian Islands and into slightly deeper water of 388 m.

DIAGNOSIS.—Lateral processes short, only as long as width, separated at most by half their diameters. Proboscis a cylinder with distal taper. Abdomen short, not extending to distal rim of first coxae, fourth legs. Chelae short, fingers placed anaxially, with 10 to 12 short teeth on each finger. Palps short, segments 2 and 3 subequal, fourth little more than half length of third, fifth longer, almost as long as third. Oviger typical, fourth segment almost as long as fifth, both with many lateral setae. Strigilis denticulate spines with two lateral lobes per side, terminal claw short. Legs conspicuously setose, with dorsal setae as long or longer than segment diameters. Tarsus short, less than half propodal length. Propodus hardly curved, sole with few longer spines, more shorter spines, no larger heel spines. Claw moderately short, auxiliaries about 0.6 main claw length.

REMARKS.—There can be little doubt that this specimen is indeed Losina-Losinsky's species. Its suite of characters agree quite closely to those of *N. bergi*, even to the conspicuously setose and spinose major leg segments. The propodal sole of the Aleutian specimen does not have the single perpendicular spine of the Russian female, but the remaining spines, setae, and distal segment dimensions agree. Perhaps the single spine is bent at its base and would appear only as long as the other sole spines if it pointed distally.

The chelae fingers of the Aleutian specimen are slightly longer, carried at more of an angle to the palm, and have a few more teeth than those of the type, but this is sometimes an artifact due to the angle at which the appendage is illustrated. The femora bear a few setae as long or longer than the segment diameter, in agreement with the type figures. The palp as attached to the neck in Losina-Losinsky's first figure appears more like that of the Aleutian specimen than the separate palp figure. This may also be foreshortening due to the angle at which the palp was illustrated. The trunk dimensions and segment lengths and those of the legs agree almost exactly with Losina-Losinsky's figures.

### *Nymphon grossipes* (O. Fabr.)

*Nymphon grossipes*.—Hedgpeth, 1963:1329–1330 [literature].

MATERIAL EXAMINED.—Pribilof Islands, S of St. George Island, 56°06'30"N, 170°22'30"W, 37 m, R/V *Albatross*, sta 3438, 3 Aug 1891 (1♀); Pribilof Islands, SE of Islands, 56°27'N, 166°08'W, 93 m, R/V *Albatross*, sta 3540, 9 Aug 1893 (1♂ with eggs, 1♀); Pribilof Islands, off St. Paul Island, 57°06'30"N, 170°28'00"W, 10 ms, R/V *Albatross*, sta 3637, 18 Jul 1895 (1♂); Bering Sea, Bower's Bank, 54°20'30"N, 179°14'00"E, 629–676 m, R/V *Albatross*, sta 4772, 4 Jun 1906 (1♂, 1♀).

Commander Islands, Bering Island, off Cooper Island, 54°49'45"N, 167°12'30"E, 102 m, R/V *Albatross*, sta 4789, 14 Jun 1906 (1♂); same locality, off Cape Monati, 54°36'15"N, 166°58'15"E, 132–139 m, R/V *Albatross*, sta 4791, 14 Jun

1906 (11 spec.); same locality, off Cape Monati, same coordinates, 132 m, R/V *Albatross*, sta 4792, 14 Jun 1906 (10+ spec.).

W of Amchitka Island, 51°29.9'N, 178°39.6'E, 154 m, R/V *Lets Go*, cruise 861, sta 57, 18 Aug 86 (2♀, 1♂ juv, 3 larvae); Aleutians, off Kiska Island, 51°46.5'N, 177°22.7'E, 137 m, R/V *Lets Go*, cruise 861, sta 62, 20 Aug 86 (2♂ with eggs, 1♀); Aleutians, Near Islands, off Attu Island, 52°57.5'N, 173°14.2'E, 88 m, R/V *Lets Go*, cruise 861, sta 76, 27 Aug 86 (2 juv); Aleutians, off Kiska Island, 52°03.9'N, 177°13.8'E, 93 m, R/V *Lets Go*, cruise 861, sta 79, 28 Aug 86 (1♀); Aleutians, off Semisopchnoi Island, 51°53.3'N, 179°45.6'E, 121 m, R/V *Lets Go*, cruise 861, sta 91, 7 Sep 86 (1 juv); same loc., 51°53.5'N, 179°44.6'E, 95 m, R/V *Lets Go*, cruise 861, sta 92, 7 Sep 86 (1♂ with eggs); Aleutians, E of Semisopchnoi Island, 51°58.5'N, 179°43.1'W, 408 m, R/V *Lets Go*, cruise 861, sta 97, 8 Sep 86 (1♀ juv); same loc., 52°07.9'N, 179°55.5'W, 135 m, R/V *Lets Go*, cruise 861, sta 100, 8 Sep 86 (1♂); same loc., 52°21.4'N, 179°49.2'W, 168 m, R/V *Lets Go*, cruise 861, sta 103, 10 Sep 86 (1♂, 1 juv).

Aleutians, S of Amchitka Island, 51°29.8'N, 178°9.0'E, 185 m, R/V *Miller Freeman*, cruise 833, sta 15, 30 Jul 83 (1♀, 1 larva); Aleutians, off Little Tanaga Islands, 52°02.1'N, 176°22.6'W, 249 m, R/V *Miller Freeman*, cruise 833, sta 56, 6 Aug 83 (1♀); Pribilof Islands, S of St. Matthew Island, 60°19'N, 173°24'W, 59 m, R/V *Miller Freeman*, cruise 791, sta 243, 21 Jul 79 (1♂).

DISTRIBUTION.—Distribution is circum-arctic with its southernmost range apparently in northern Japan, Puget Sound, Washington, and Long Island Sound, New York, with various equally southern records for northern Europe. Its depth range varies widely from about 10 to 1200+ m.

DIAGNOSIS.—Species extremely variable, particularly in appendage-length ratios. Resembling *N. brevitarse* in many characters, except for minor differences. Chela palm of *N. grossipes* is much longer than its short fingers, tarsus length equals propodus (or is sometimes shorter), ocular tubercle is taller, third palp segment much longer and fifth segment longer than fourth, and major leg segments are measurably longer than in *N. brevitarse*.

Variation occurs in terminal leg segment length ratios. Tarsus can be slightly shorter than propodus or twice as long as propodus or longer, and sole spines vary in number and length.

REMARKS.—This species is by far the most common *Nymphon* in the Bering Sea, as the above collecting records suggest. It was recorded (under a wide variety of synonyms) in most collecting reports from Arctic waters and is found in temperate waters at higher latitudes.

### *Nymphon hirsutum*, new species

FIGURE 8

MATERIAL EXAMINED.—Aleutians, S of Amchitka Island, 51°25.8'N, 178°50.5'E, 205 m, R/V *Miller Freeman*, cruise 833, sta 16, 30 Jul 83 (1♂ with eggs, holotype, USNM

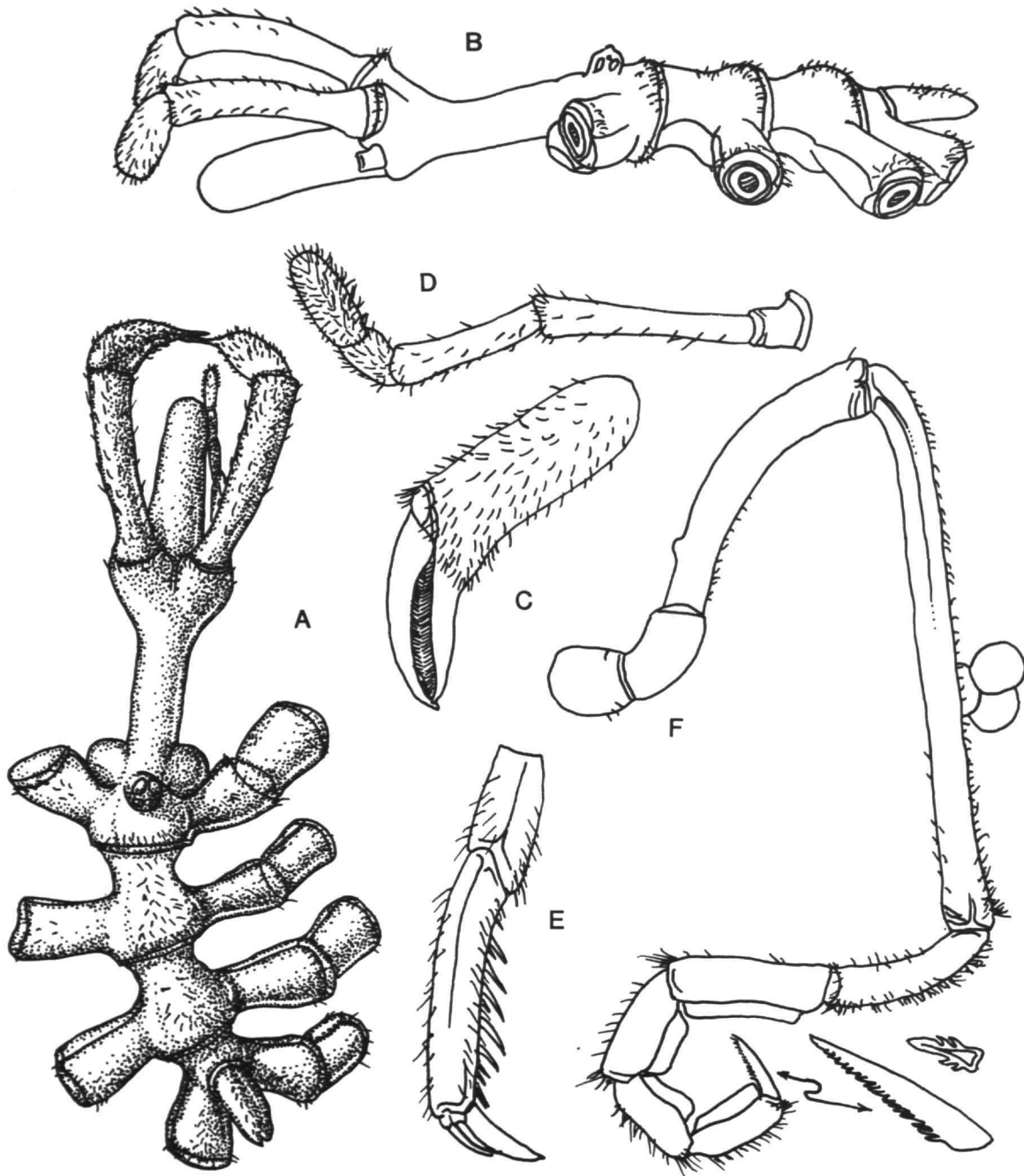


FIGURE 8.—*Nymphon hirsutum*, new species, holotype male: A, trunk, dorsal view; B, trunk, lateral view; C, chela; D, palp; E, distal leg segments; F, oviger with three eggs attached, terminal claw and denticulate spine, enlarged.

234652); Aleutians, off Little Tanaga Island, 51°36.3'N, 176°22.2'W, 274 m, R/V *Miller Freeman*, cruise 833, sta 87, 12 Aug 83 (1♂, paratype, USNM 234653).

DISTRIBUTION.—Known only in the Rat Island Group and in the adjacent Andreanof Islands, in 205 to 274 m.

DESCRIPTION.—Species fairly large, leg span about 125 mm.

Trunk, lateral processes, chelifores, and abdomen with fields of tiny setules on raised surfaces. Lateral processes separated by distances equal to diameters, each about 1.5 times longer than diameters. Ocular tubercle shorter than wide, eyes very large, well pigmented. Neck moderately long, sides parallel, ovigers implanted posteriorly against first lateral processes. Proboscis a slightly downcurved cylinder in lateral view, moderately tapering to narrow tip in dorsal view, subequal in length to neck. Abdomen carried horizontally, short, no longer than fourth lateral processes.

Chelifore scapes as long as proboscis, with many dorsal and lateral setae. Chelae with many short setae, palm cylindrical, longer than anaxially directed fingers, armed with 26 short teeth on immovable finger, 34 smaller teeth on movable finger. Fingers do not overlap at tips. Oviger (male) fourth segment very curved, about 0.6 as long as straight fifth segment. Egg diameter only slightly greater than fifth segment diameter. Strigilis segments with many short ectal setae, endal denticulate spines in formula 11 : 6 : 6 : 6, and terminal claw 0.6 as long as terminal segment, bearing 20 tiny endal teeth.

Legs with many short spines, few longer setae, some as long as segment diameters. First tibia little longer than femur, second tibia 1.5 times femur length. Tarsus short, only twice as long as wide, with few short setae. Propodus quite short, only about twice tarsus length, armed with 4–5 longer sole spines, 10–12 very short sole spines or setae, very short robust claw, and auxiliary claws about half as long as main claw.

Female characters unknown.

MEASUREMENTS (in mm).—Trunk length (chelifore insertion to tip 4th lateral processes), 12.5; trunk width (across 2nd lateral processes), 5.8; proboscis length, 4.4; abdomen length, 1.4; 3rd leg, coxa 1, 1.7; coxa 2, 5.5; coxa 3, 2.9; femur, 11.9; tibia 1, 12.8; tibia 2, 19.3; tarsus, 1.4; propodus, 2.8; claw, 1.1.

ETYMOLOGY.—The name (Latin: *hirsutus*, meaning hairy or shaggy) refers to fields of short setae on most elevated or convex dorsal surfaces including on the appendages.

REMARKS.—The neck is about the same length as that of *N. longitarse* Krøyer, but the species has almost no other characters in agreement with that species. Another species with moderately long neck and very small terminal leg segments, *N. micropedes* Hedgpeth, has extremely long legs and palps, and very much longer chelifores than *N. hirsutum*. The combination of the very short terminal leg segments, very short palp, moderately long neck length, short chelae, and the hirsute nature of this species differentiates it from all others, particularly in the north Pacific.

#### *Nymphon longitarse* Krøyer

*Nymphon longitarse* Krøyer, 1844:112.—Hedgpeth, 1948:247–248; 1963:1330–1331 [literature].

MATERIAL EXAMINED.—Aleutians, NW of Unalaska Island, 53°33.5'N, 167°34.9'W, 84 m, R/V *Lets Go*, cruise 861, sta 116, 20 Sep 86 (1♂).

Pribilof Islands, SW of St. Matthew Island, 59°10'N, 175°59'W, 137 m, R/V *Paragon II*, cruise 791, sta 219, 15 Jul 79 (1♂).

DISTRIBUTION.—*N. grossipes* and this species share much the same distribution, although *N. longitarse* has not been taken in nearly as many places as that species. Hedgpeth lists it as circumpolar Arctic, in fairly shallow water.

DIAGNOSIS.—Trunk glabrous, lateral processes separated by intervals equal to diameters, about 1.5 times longer than diameters. Neck moderately long, ocular tubercle wider than tall, eyes large. Proboscis a cylinder tapering distally. Abdomen short, not as long as fourth lateral processes.

Chelifore scapes as long as proboscis, palm rectangular, with many ventral setae, fingers shorter, slender, carried at acute angle, armed with many tiny teeth. Palp second and third segments subequal, fourth very short, fifth about as long as third, distal 2 segments with many short setae. Oviger terminal claw with many tiny teeth. Legs long, slender, tarsus about 1.5 times longer than slender propodus, both with tiny sole spines. Claw slender, slightly less than half propodus length, auxiliaries less than 0.3 main claw length.

REMARKS.—This species is rather elusive. There are few good illustrations of its distinctive characters and most descriptions lack comment on most of these characters. The main differences are found in the very long tarsus with shorter propodus, very long and setose terminal palp segment, chelae fingers carried almost at a right angle to the palms, and the moderately long neck with a very low ocular tubercle placed at its posterior.

#### *Nymphon microsetosum* Hilton

*Nymphon microsetosum* Hilton, 1942a:6.—Hedgpeth, 1949:274, fig. 34h.

MATERIAL EXAMINED.—Aleutians, N of Amchitka Island, 52°11'N, 179°49'E, 79–95 m, R/V *Albatross*, sta 4777, 4 Jun 1906 (2♂, syntypes, USNM 81510); Aleutians, off Attu Island, 52°55'40"N, 173°26'00"E, 247 m, R/V *Albatross*, sta 4784, 11 Jun 1906 (1♂ with eggs, 1♂, 1♀, non-types listed by Hilton).

Aleutians, Kiska Island, Kiska Harbor, coll. W.H. Dall, sta (1035), 18 m, 1873 (2♀, 1 juv); Aleutians, Amchitka Island, Constantine Harbor, coll. W.H. Dall, sta 250 (1040), 11–18 m, 1873 (1♀). Listed by Hilton in addition to the *Albatross* syntypes above.

DISTRIBUTION.—Known only from the western Aleutians in 11–247 m, and has apparently not been taken since the *Albatross* specimens were described. Hedgpeth reexamined Hilton's types but lacked additional specimens with which to enlarge the description. Hedgpeth determined that this is a valid species, an opinion in which I concur.

DIAGNOSIS.—Short conspicuous spines on trunk, chelifore scapes, and proximal leg segments, very short tarsus in conjunction with large species size, and subequal size of major oviger segments. Second segment of palp longer than third and

fifth is only slightly longer than fourth. Chela fingers placed synaxially and shorter than palm. Propodus short, very curved, with four heel spines and few sole spines. Claw very long in relation to short propodal length and auxiliaries are less than half propodal length.

REMARKS.—These specimens were all listed by Hilton but with errors and in such a confusing lack of order that I feel it will be useful to reintroduce them into the literature for a second time in correct order even though there were no additional specimens taken during the Bering Sea Program.

This is another in the wealth of *Nymphon* species found in the North Pacific, and Hedgpeth (1949:274) outlines differences between this and other North Pacific species. The many short trunk and appendage spines and the very short tarsus and propodus serve to separate this species from most others from the far North Pacific.

#### *Nymphon* species indeterminate

MATERIAL EXAMINED.—Aleutians, S of Delarof Islands, 51°16.6'N, 179°14.6'W, 97 m, R/V *Lets Go*, cruise 861, sta 50, 14 Aug 86 (1 juv).

Pribilof Islands, off St. Paul Island, 57°04'N, 170°18'W, 40 m, R/V *Miller Freeman*, cruise 888, sta Grab 7, 19 Sep 88 (1 juv).

REMARKS.—Both of these specimens are too young to identify.

#### Family COLOSSENDEIDAE Hoek

##### Genus *Colossendeis* Jarzynsky, 1870

##### *Colossendeis colossea* Wilson

*Colossendeis colossea* Wilson, 1881:244–246, pl. I: fig. 1; pl. III: figs. 5–7.—Fry and Hedgpeth, 1969:53–54, fig. 8 [literature].—Stock, 1975a:987; 1983:300; 1986b:418.—Nakamura and Child, 1991:62.—Bamber and Thurston, 1993:859.

MATERIAL EXAMINED.—Aleutians, S of Pribilof Islands, 55°23'00"N, 170°31'00"W, 3239 m, R/V *Albatross*, sta 3603, 11 Aug 1895 (3 spec.); same station (4 spec., identified as *C. spinifera* by W.A. Hilton (1943a:3)); Bering Sea, SW of Pribilof Islands, 56°12'N, 172°07'W, 2972 m, R/V *Albatross*, sta 3308, 4 Aug 1890 (1 spec.).

Aleutians, NE of Semisopchnoi Island, 52°12.5'N, 179°41.1'W, 350 m, R/V *Halfmoon Bay*, cruise 801, sta 64, 27 Jul 1980 (1 spec.).

DISTRIBUTION.—A cosmopolitan deep-water species.

DIAGNOSIS.—Largest species of genus known in Arctic. Legs extremely long, leg span up to 70 cm. Proboscis about 1.5 times longer than trunk, medially inflated, narrowing proximally and distally, with slightly swollen oral surface, not conspicuously curved. Distal palp 3 segments subequal in length. Tarsus about 1.5 times longer than propodus, claw slightly less than half propodal length.

REMARKS.—This is a very large species (although the

achelate juveniles are often quite small in relation to adults) taken in practically all deep-sea surveys and is difficult to confuse with any other species, principally due to its size.

##### *Colossendeis dalli*, new species

##### FIGURE 9

MATERIAL EXAMINED.—Aleutians, S of Kiska Island, 51°43.0'N, 177°19.3'E, 567 m, R/V *Miller Freeman*, cruise 833, sta 3, 28 Jul 1983 (1 spec., paratype, USNM 234655); cruise 833, sta 4, off Kiska Island, 51°32.6'N, 177°19.3'E, 377 m, 28 Jul 1983 (1 spec., holotype, USNM 234654).

OTHER MATERIAL.—Aleutians, off Delarof Islands, 51°14.9'N, 179°11.1'W, 155 m, R/V *Lets Go*, cruise 861, sta 54, 17 Aug 1986 (1 spec.); Aleutians, off Little Tanaga Islands, 52°02.1'N, 176°22.6'W, 249 m, R/V *Miller Freeman*, cruise 833, sta 56, 6 Aug 1983 (2 spec.).

DISTRIBUTION.—Known in a restricted area from its type locality, the western Aleutians, in 377 to 567 m, and from other material taken at nearby islands in 155 to 249 m.

DESCRIPTION.—Size moderately small for member of genus, leg span 212.5 mm. Lateral processes separated by half their diameters or slightly less, widest distally, slightly wider than their length. Ocular tubercle leaning slightly anteriorly, with apical cone, anterior eyes twice as large as posterior pair. Proboscis about 1.1 longer than trunk, with swellings just distal to midpoint and at tip, slight distal downcurve in lateral view. Abdomen slender, carried horizontally, extending to midpoint of first coxae on fourth leg pair.

Palps moderately short, third segment longest, fifth segment only 0.6 length of third, sixth subequal in length to eighth and ninth, seventh almost twice longer, terminal segment shorter than eighth and ninth. Distal 4 segments armed with pile of very short ventral spines. Ovipiger extremely long, slender, strigilis armed with typical fields of finely serrate spines. Terminal claw small, slender, well curved, only slightly longer than maximum diameter of segment.

Legs slender, first tibiae the longest segments with femora next longest, second tibiae with moderate ventral curve. Tarsus and propodus with very small sole spines of 2 sizes, propodus only 0.64 as long as tarsus, claw very short, only about 0.4 as long as propodus.

MEASUREMENTS (holotype, in mm).—Trunk length (anterior rim to 4th lateral process tips), 12.0; trunk width (across 2nd lateral processes), 5.7; proboscis length, 14.6; abdomen length, 2.8; third leg, coxa 1, 1.5; coxa 2, 2.6; coxa 3, 2.5; femur, 28.6; tibia 1, 30.4; tibia 2, 24.3; tarsus, 7.2; propodus, 4.6; claw, 1.7.

ETYMOLOGY.—This species is named for Dr. William H. Dall, whose thirst for malacology took him to Alaska in the 1870s. He was one of the first naturalist-explorers to reach these very remote and forbidding shores shortly after America purchased Alaska from the Russians in 1867. He returned to the "lower forty-eight" United States with such diverse and far-reaching collections that eventually prominent Alaskan

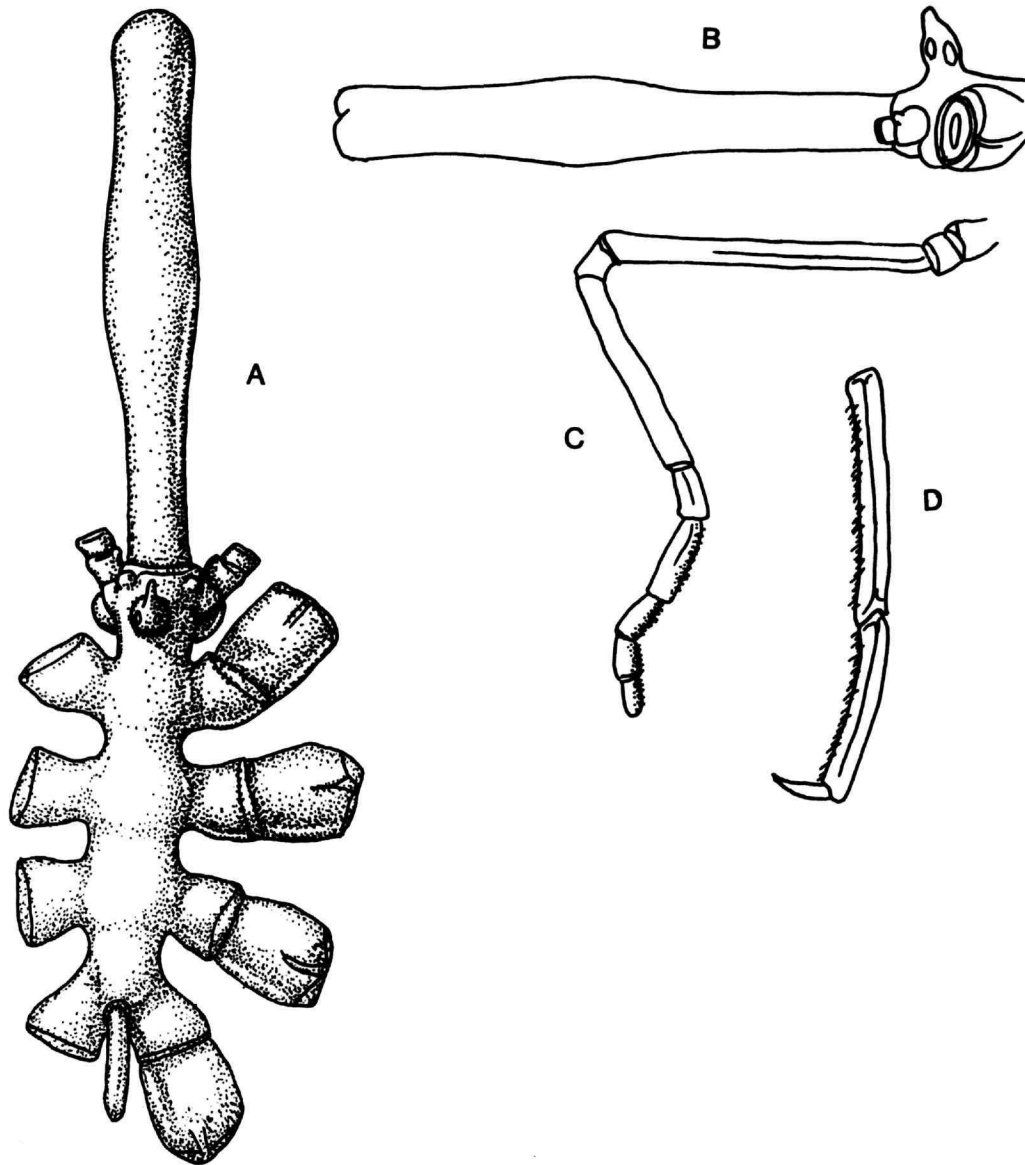


FIGURE 9.—*Colossendeis dalli*, new species, holotype specimen: A, trunk, dorsal view; B, trunk anterior and proboscis, lateral view; C, palp; D, distal leg segments.

mammals were named for him, including a mountain sheep, a porpoise, and many molluscs among other fauna.

REMARKS.—This new species was first confused with juveniles of the well known *C. colossea*, but the shorter proboscis of these specimens lead to a more critical examination.

The species is closest in comparison to the type of *C. bicincta* Schimkewitsch, but not with the specimen of the same species illustrated in figure 1 by Stock (1978:404, fig. 1).

Stock's figure, I believe, represents an unnamed species that has, among other characters, a notably longer and more curved proboscis than is borne by the type of *C. bicincta*. The proboscis of this new species is extremely like that of Schimkewitsch's type, as are the ovigers. The differences lie in the palp, which has distal segments of much different lengths and different spination than those of *C. bicincta*. The fifth palp segment is almost as long as the third and the sixth and eighth segments of *C. bicincta* are notably longer than the correspond-



ing palp segments in *C. dalli*. The tarsus of the type of *C. bicincta* is much longer in relation to the propodus and the terminal claw is shorter in the same relationship. The propodus of *C. bicincta* is little more than half the length of its tarsus.

#### *Colossendeis macerrima* Wilson

*Colossendeis macerrima* Wilson, 1881:246–247, pl. 1: fig. 2; pl. 3: figs. 9–12; pl. 5: fig. 32.—Nakamura and Child, 1991:62 [literature].—Stock, 1990:220–221; 1991c:138.—Turpaeva, 1990:115–116; 1991:41–42; 1992:94.—Child, 1992:42.—Bamber and Thurston, 1993: 858–859.

**MATERIAL EXAMINED.**—Aleutians, S of Pribilof Islands, 55°23'00"N, 170°31'00"W, 3239 m, R/V *Albatross*, sta 3603, 11 Aug 1895 (2 spec.).

**DISTRIBUTION.**—A cosmopolitan species in deep-seas.

**DIAGNOSIS.**—Proboscis very slender, medially swollen, tapering distally, slightly upturned (with variation in the low angle of upturn) and much longer than trunk. Palp segment 5 much longer than segment 3, sixth and seventh are subequal, distal 3 much shorter than sixth or seventh and subequal to each other. Legs very slender, tarsus about 1.4 to 2.0 times longer than propodus, terminal claw about half as long as propodus.

**REMARKS.**—The long narrow upturned proboscis is a conspicuous diagnostic character in this species. In some specimens it appears like a bent pipette.

This species appears in most deep-sea records of collections from any of the oceans.

#### *Colossendeis microsetosa* Hilton

FIGURE 10

*Colossendeis microsetosa* Hilton, 1943a:4.  
*Colossendeis orientalis* Losina-Losinsky, 1958:29, 31, 34 [key], fig. 4.

**MATERIAL EXAMINED.**—Aleutian Islands, Unalaska Island, off Dutch Harbor, 54°01'40"N, 166°48'50"W, 640 m, R/V *Albatross*, sta 3331, 21 Aug 1890 (1♀, holotype, USNM 81528).

Another specimen, not a type, from the same station, which was identified as *Colossendeis* sp. by L. Giltay and apparently not seen by Hilton.

Aleutians, off Kiska Island, 51°32.6'N, 177°19.3'E, 377 m, R/V *Miller Freeman*, cruise 833, sta 4, 28 Jul 1983 (1 spec.). Aleutians, off Little Tanaga Islands, 52°02.1'N, 176°22.6'W, 249 m, R/V *Miller Freeman*, cruise 833, sta 56, 6 Aug 1983 (1 spec.).

**DISTRIBUTION.**—The type locality is to the east of the western Aleutian Islands localities of the *Miller Freeman*. Its depth range is from 249 to 640 m.

The western Aleutian localities of this species are very

shallow in relation to the majority of depths recorded for members of this deep-sea genus, but this same phenomenon occurs in Antarctic seas where some *Colossendeis* have been taken in 20 to 30 m or even less. *Colossendeis microsetosa* is only known from the Aleutian Islands except for Losina-Losinsky's specimens, which came from the Sea of Okhotsk.

**DIAGNOSIS.**—Proboscis moderately narrow, expanding proximally to midpoint, with slight taper distal to midpoint, about 1.8 times length of trunk, with moderate distal downcurve in lateral view. Trunk typical, lateral processes slightly longer than their diameters. Ocular tubercle a truncate cone, anterior pair of eyes twice larger than posterior pair. Abdomen carried horizontally, moderately long, extending beyond distal rim of first coxae of 4th leg pair.

Palp segment 3 about 1.3 times length of segment 5, distal 5 segments subequal in length, with ventral fields of tiny spines. Legs slender, tarsus short, only about 0.4 times as long as slightly curved propodus. Both tarsus and propodus with very short sole spines and scattered lateral and dorsal setae. Terminal claw about 0.3 times length of propodus.

**REMARKS.**—Hilton's description was entirely inadequate and no figures of the species were published. It is thus not surprising that the species has remained unknown until now. Also, very few collections of natural history specimens have come from the Aleutians where inclement weather is normal. This makes collecting an almost continuous series of hardships. Hilton's specimen is in very good shape.

According to the figures given by Losina-Losinsky for her species, there can be little doubt that *C. orientalis* is Hilton's previously named *C. microsetosa*. Almost all critical characters agree in illustrations of both.

This species is superficially like *C. nasuta* Hedgpeth, with the principal difference found in the terminal leg segments of each. These are quite short for Hilton's species with the tarsus only about three times longer than its diameter and half as long or slightly less than the propodus. Both segments have many crowded short sole spines and the claw is robust and quite short. In Hedgpeth's species, the tarsus is subequal to the propodus and the claw is very long and slender. Another difference is found in the proboscis of each species where, in Hilton's species, it is broader in its distal third and is terminally swollen. In *C. nasuta*, the proboscis tapers to a fine point. There are some other minor differences in the terminal five palp segments in which the proportions and the relationship between each differ according to the species. The subequal five distal palp segments also serve as a good recognition character for this species.

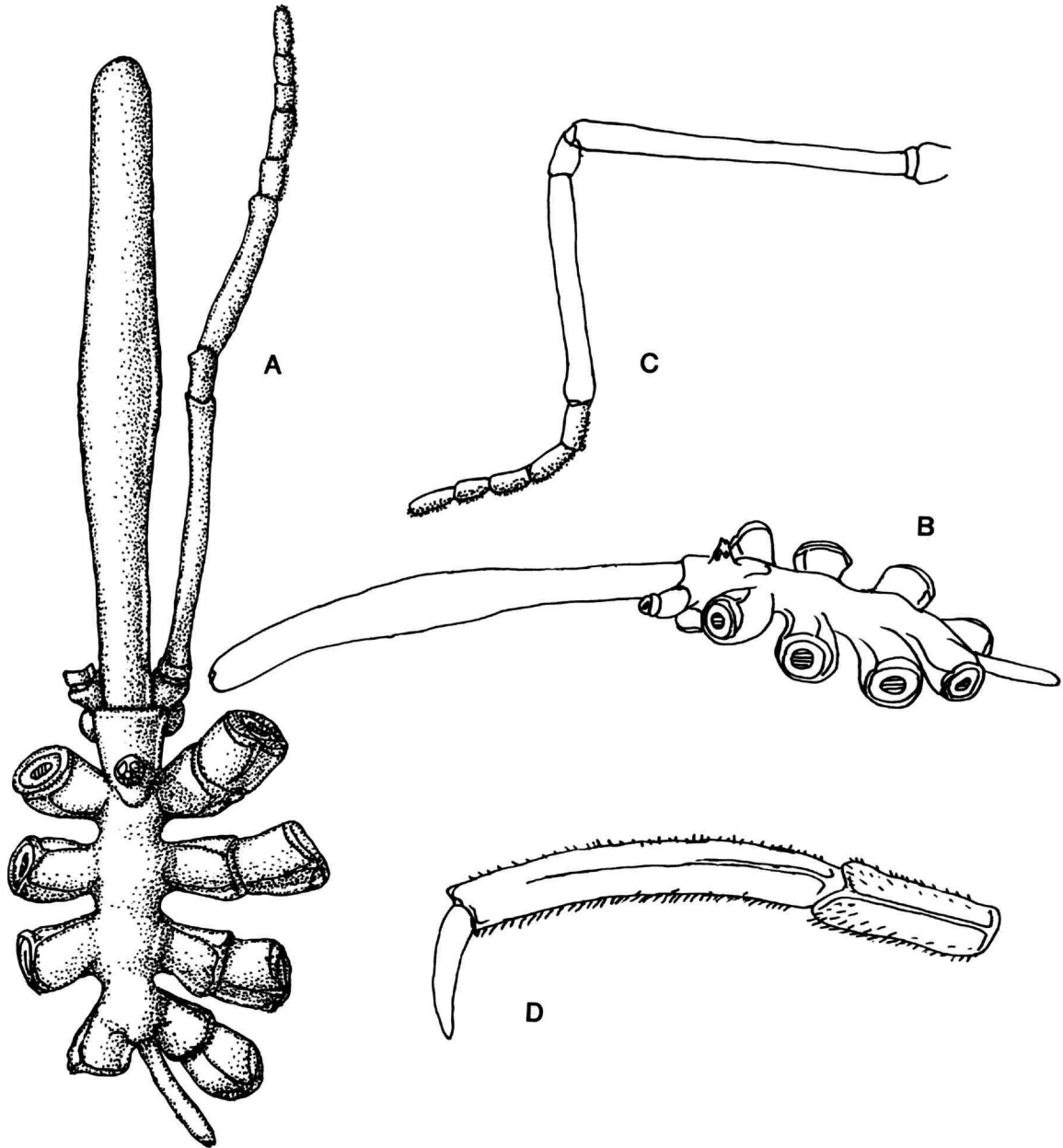


FIGURE 10.—*Colossendeis microsetosa* Hilton, holotype female: A, trunk, dorsal view; B, trunk, lateral view; C, palp; D, distal leg segments.

***Colossendeis peloria* Child**

*Colossendeis peloria* Child, 1994:13–14, figure 3.

**MATERIAL EXAMINED.**—Aleutians, SE of Agattu Island, 52°01'N, 174°39'E, 1913 m, R/V *Albatross*, sta 4780, 7 Jun 1906 (2 spec.)

**DISTRIBUTION.**—Previously known only from its type locality in California's Monterey Canyon, in 2620 to 2900 m. This new record extends the known distribution considerably to the northwest in the western Aleutians and into slightly shallower water.

**DIAGNOSIS.**—Relatively huge species with rather short legs. Proboscis much like preceding species, *C. microsetosa* Hilton, in length, swellings, and slight distal downcurve. Species blind, ocular tubercle a low broad mound with slight depression at midpoint. Lateral sensory papillae not evident. Abdomen slightly longer than distal rim of first coxae, fourth legs and carried below horizontal.

Oviger terminal claw broad, not as long as segment diameter. Distal palp 5 segments of different lengths in relation to each other with seventh the longest, sixth next shorter, and eighth, ninth, and tenth each successively shorter. Legs slender and short in comparison with others of genus. Tarsus about 1.4 times longer than slender propodus. Terminal claw about 0.25 times propodal length. Both tarsus and propodus glabrous.

**REMARKS.**—The great size of this species in which the trunk is larger than that of very large *C. colossea*, is a character that makes it fairly easy to distinguish from others in the Aleutians. This character with the long proboscis and rather short legs of the species makes it even easier to separate from known North Pacific species.

***Colossendeis tenera* Hilton**

*Colossendeis tenera* Hilton, 1943a:2–4.—Hedgpeth, 1943:223–224, fig. 1.—Child, 1994:14, 16.

**MATERIAL EXAMINED.**—Bering Sea, W of Pribilof Islands, 57°10'N, 173°45'W, 148 m, R/V *Albatross*, sta 3487, 13 Jul 1893 (2 stations mixed, locality questionable, 1 spec.); Bering Sea, near Bowers Bank, 54°33'N, 178°45'E, 1019 m, R/V *Albatross*, sta 4774, 4 Jun 1906 (1 spec.); Aleutians, SE of Agattu Island, 52°14'30"N, 174°13'00"E, 882 m, R/V *Albatross*, sta 4781, 7 Jun 1906 (1 spec.).

**DISTRIBUTION.**—Fairly common on slopes and basins of American west coast from middle California to southeast Alaska, in depths of 914 to 3600 m. The above records greatly extend this distribution northwestward to the western Aleutians and reduce its minimum known depth to at least 882 m. The *Albatross* record of 148 m is very questionable. The other station of the two mixed in the lot is from California and at a much greater depth.

**DIAGNOSIS.**—Proboscis almost cylindrical, about as long as trunk. Ocular tubercle a tall conspicuous cone with eyes barely distinguishable. Palp with tiny eighth segment no longer than

wide, shorter than 2 more distal segments. Legs very slender, almost glabrous, tarsus only slightly longer than propodus. Terminal claw very slender, as long or slightly longer than the propodus.

**REMARKS.**—The tall conical ocular tubercle, relatively short proboscis, tiny eighth palp segment, and slender legs with very long claws are sufficient characters to distinguish this species from any other known northern Pacific members of this genus.

**Genus *Hedgpethia* Turpaeva, 1973**

It was recently proposed (Pushkin, 1990:36–39) that this genus be elevated to the rank of a separate family based on the wide separation of trunk segments in the genus. The remaining species in the family Colossendeidae were described as having closely spaced trunk segments, that is, closer than in species of *Hedgpethia*. I believe this differentiation is insufficient reason to create a family. The character is not entirely consistent and additional differences in multiple characters are needed to create a family, particularly in a group like the pycnogonids that share more homogeneous characters than many other classes of animals.

***Hedgpethia chitinosa* (Hilton)**

*Colossendeis chitinosa* Hilton, 1943a:4.—Utinomi, 1971:337–338 [literature]. *Rhopalorhynchus chitinosum*.—Stock, 1970:9 [key]. *Hedgpethia californica chitinosa*.—Turpaeva, 1973:186–189, table 3. *Hedgpethia chitinosa*.—Nakamura and Child, 1983:63; 1991:63.—Nakamura, 1987:36–37, pl. 33.

**MATERIAL EXAMINED.**—Bering Sea, S of Pribilof Islands, 56°02'N, 169°30'W, 221 m, R/V *Albatross*, sta 3500, 17 Jul 1893 (1 spec., Hilton's holotype specimen, USNM 81496); Gulf of Alaska, off Trinity Islands, 56°00'N, 154°20'W, 291 m, R/V *Albatross*, sta 2853, 9 Aug 1888 (1 spec.).

**DISTRIBUTION.**—Known from many Japanese localities including the Sea of Japan, it is also found across the North Pacific from the Russian Far East to the Aleutian Islands. The above records extend this distribution to the Pribilof Islands and the Gulf of Alaska. It has a very wide depth range, from 20 to 950 m, if all records are to be credited.

**DIAGNOSIS.**—Proboscis with major distal swelling from midpoint to about halfway to tip. Each dorsomedian trunk swelling sometimes with conical projection. Oviger claw shorter than its segment diameter, with distal spine larger than others in opposition to claw. Tarsus sometimes equal to or sometimes slightly longer than propodus, both with tiny sole spines. Terminal claw very long, usually slightly shorter than propodus but sometimes as long as segment.

**REMARKS.**—This species is sometimes very difficult to separate because of similarities to the more common *H. dofleini* (Loman). It is easier with both species in hand where the size difference is made evident. This species is about a third the size of Loman's species and invariably has a notably longer and

more slender propodal claw. The latter character is the only major difference in the two species.

***Hedgpethia dofleini* (Loman)**

*Colossendeis dofleini* Loman, 1911:4-5, pl. 1: figs. 9-13.—Utinomi, 1971:337 [literature].

*Rhopalorhynchus dofleini*.—Stock, 1958b:114-118 [text].

*Hedgpethia dofleini*.—Turpaeva, 1973:183 [text], 184 [table, key].—Nakamura and Child, 1991:63.

**MATERIAL EXAMINED.**—Aleutians, W of Unalaska Island, 53°43'40"N, 167°29'30"W, 412 m, R/V *Albatross*, sta 3227, 23 May 1890 (1 spec.); Aleutians, N of Unalaska Island, 53°33'50"N, 167°46'50"W, 200 m, R/V *Albatross*, sta 3324, 20 Aug 1890 (1 spec.); Aleutians, off Unalaska Island, 54°01'40"N, 166°48'50"W, 640 m, R/V *Albatross*, sta 3331, 21 Aug 1890 (2 spec.); Bering Sea, S of Pribilof Islands, 56°02'N, 169°30'W, 221 m, R/V *Albatross*, sta 3500, 17 Jul 1893 (1 spec.).

Aleutians, W of Amchitka Island, 51°14.5'N, 178°39.6'E, 154 m, R/V *Lets Go*, cruise 861, sta 57, 18 Aug 1986 (3 spec.); Aleutians, off Kiska Island, 51°46.5'N, 177°22.7'E, 137 m, R/V *Lets Go*, cruise 861, sta 62, 20 Aug 1986 (4 spec.); Aleutians, off Agattu Island, 52°27.7'N, 173°47.1'E, 75 m, R/V *Lets Go*, cruise 861, sta 63, 23 Aug 1986 (2 spec.); Aleutians, off Attu Island, 53°01.7'N, 173°11.0'E, 137 m, R/V *Lets Go*, cruise 861,

sta 77, 27 Aug 1986 (1 flaccid spec.); Aleutians, off Semisopochnoi Island, 52°10.8'N, 179°51.2'W, 165 m, R/V *Lets Go*, cruise 861, sta 99, 8 Sep 1986 (2 spec.); same locality, 52°21.4'N, 179°49.2'W, 168 m, R/V *Lets Go*, cruise 861, sta 103, 10 Sep 1986 (7 spec.).

Aleutians, off Little Tanaga Islands, 52°02.1'N, 176°22.6'W, 249 m, R/V *Miller Freeman*, cruise 833, sta 56, 6 Aug 1983 (3 spec.).

**DISTRIBUTION.**—These 27 specimens suggest that this species is rather common in western Aleutian localities and at a wide range of depths. It is known from Kyushu, Japan, to the Bering Sea and Aleutian Islands in depths from 20 to 923 m.

**DIAGNOSIS.**—Two or 3 times larger than *H. chitinosa* or larger. Adults of both species should be examined for this comparison to be meaningful. Posterior ridges of each trunk segment without pointed tubercles. Proboscis major swelling is proximal to midpoint. Tarsus nearly equal to propodal length and spinules of sole are not conspicuous. Ovipiger terminal claw robust, longer than width of terminal segment, which lacks large spine in opposition to claw.

**REMARKS.**—Hedgpeth (1949:302, fig. 47) published a good comparative set of figures of this species and *H. chitinosa*. Both species are common across the North Pacific and this species has more variability than *H. chitinosa*, making them more difficult to separate than species without as much variability.

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