

The Pycnogonida types of William A. Hilton. II. The remaining undescribed species

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Abstract.—The four remaining questionable species named by W. A. Hilton between 1939 and 1942 are described as if they were newly discovered, are illustrated where necessary, and compared with others described by Hilton and other authors of American west coast pycnogonids. The species are: *Achelia simplissima*, *A. spinoseta*, *Ammothella setosa*, and *Tanystylum duospinum*. The latter species is found to be the earliest valid name for several synonym species described later. Another little known species, *Achelia harrietae* Marcus, 1940, is illustrated and compared with *A. spinoseta*, a close relation. A complete list of the 66 Hilton species with original names, dates of publication, and current identifications are given.

This is the second paper to investigate the pycnogonids which William A. Hilton described in a preliminary and inadequate form. The first paper (Child 1975) treated a single family, the Phoxichilidiidae. Besides the species discovered to be valid or synonyms by other authors in that paper, this writer later chose to introduce descriptions and illustrations of Hilton's other unknown or inadequately known species when and where they could be placed with others of the same genus or in papers treating pycnogonids of the same locality.

William A. Hilton described 66 pycnogonid species (using 70 names, thus creating a few instant synonyms) mainly collected from California and Alaska, including the Aleutian and other offshore Alaskan Islands. He published these, for the most part, in the Journal of Entomology and Zoology of Pomona College (California), of which he was editor for many years. Most were loaned by the National Museum of Natural History whose collections fortunately now contain 57 of these types or type series while nine are deposited in the B. P. Bishop Museum, Honolulu, Hawaii.

It has been difficult at times to introduce

some of Hilton's species for clarification in publications based on localities other than California and Alaska, and thus it has been found necessary to place these last few descriptions and illustrations in their own report. All of these species remain valid. All species named by Hilton, including the four listed herein, have now been redescribed or reduced to synonyms by this writer and other authors, most notably Hedgpeth in his several eastern Pacific rim reports (Table 1). It was found beneficial to illustrate a little known species of *Achelia*; *A. harrietae* Marcus, 1940 (described as *A. discoidea* Exline, 1936, preoccupied). This is done both because the original illustrations are inadequate and the report is generally unavailable to today's specialists. The species has not been collected or illustrated since the type was described. It is also illustrated herein because it must be compared with the closely related species, *A. spinoseta* Hilton, 1939, described and illustrated herein. The types of Exline's species (undamaged holotype and 23 paratypes, USNM 71500 and 71501), from Puget Sound, Washington, are also deposited in the National Museum of Natural History collections.

Table 1.—List of Pycnogonid species named by William A. Hilton.

Hilton's species name	Present designation
Ammonotheidae:	
<i>Ammonothea chelata</i> , 1939a	<i>Achelia chelata</i> (Hilton)
<i>A. elongata</i> , 1942g	<i>Achelia borealis</i> (Schimkewitsch)
<i>A. grossifemora</i> , 1942g	<i>Tanystylum grossifemora</i> (Hilton)
<i>A. megova</i> , 1942g	<i>Achelia megova</i> (Hilton)
<i>A. ovosetosa</i> , 1942g	<i>Achelia ovosetosa</i> (Hilton)
<i>A. simplissima</i> , 1939a	<i>Achelia simplissima</i> (Hilton)
<i>A. spinoseta</i> , 1939a	<i>Achelia spinoseta</i> (Hilton)
<i>Ammothella biunguiculata</i> var. <i>fusca</i> , 1942d	<i>Ammothella biunguiculata</i> (Dohrn)
<i>A. heterosetosa</i> , 1942b	Name Valid
<i>A. pacifica</i> , 1942d	Name Valid
<i>A. setosa</i> , 1942g	Name Valid
<i>Ascorhynchus laterospinus</i> , 1942g	Name Valid
<i>Eurycyde longisetosa</i> , 1942b	Name Valid
<i>E. spinosa</i> , 1916	Name Valid
<i>Lecythorhynchus ovatus</i> , 1942d	<i>Ammonothea hilgendorfi</i> (Böhm)
<i>Leionymphon dorsiplicatum</i> , 1942g	<i>Ammonothea dorsiplicata</i> (Hilton)
<i>Nymphopsis duodorsospinosa</i> , 1942b	Name Valid
<i>Tanystylum californicum</i> , 1939a	Name Valid
<i>T. duospinum</i> , 1939a	Name Valid
<i>T. nudum</i> , 1939a	Nomen Dubium, specimen lost
<i>T. oculospinosum</i> , 1942e	<i>T. duospinum</i> Hilton
<i>T. panamum</i> , 1942e	<i>T. intermedium</i> Cole
Phoxichilidiidae:	
<i>Anoplodactylus compactus</i> , 1939a	Name Valid
<i>A. intermedius</i> , 1942d	<i>A. batangensis</i> (Helfer)
<i>A. nodosus</i> , 1939a	Name Valid
<i>A. oculospinus</i> , 1942f	Name Valid
<i>A. pacificus</i> , 1942f	Name Valid
<i>A. projectus</i> , 1942d	<i>A. californiensis</i> Hall
<i>A. robustus</i> , 1939a	<i>A. californiensis</i> Hall
<i>A. unospinus</i> , 1942f	<i>Phoxichilidium</i> sp. juv.
<i>Halosoma compactum</i> , 1942f	<i>Anoplodactylus compactus</i> (Hilton)
<i>Phoxichilidium micropalpidum</i> , 1942f	Name Valid
<i>P. parvum</i> , 1939a	Name preoccupied
<i>P. quadridentatum</i> , 1942f	Name Valid
<i>P. truncatum</i> , 1942d	<i>Anoplodactylus pycnosoma</i> (Helfer)
<i>Pigrogromitus robustus</i> , 1942c	<i>Pycnosomia strongylocentroti</i> Losina-Losinsky
Colossendeidae:	
<i>Colossendeis chitinsa</i> , 1943a	<i>Hedgpethia chitinsa</i> (Hilton)
<i>C. microsetosa</i> , 1943a	Name Valid
<i>C. spinifera</i> , 1943a	<i>C. colossea</i> Wilson
<i>C. tenera</i> , 1943a	Name Valid
Endeididae:	
<i>Endeis compacta</i> , 1943b	<i>Anoplodactylus viridintestinalis</i> Cole
<i>E. nodosa</i> , 1942d	Name Valid
<i>Phoxichilus compactus</i> , 1939a	(see <i>Endeis compacta</i>)
Nymphonidae:	
<i>Chaetonymphon duospinum</i> , 1942a	<i>Nymphon duospinum</i> (Hilton)
<i>C. quadrispinum</i> , 1942a	<i>Nymphon duospinum</i> (Hilton)
<i>Nymphon basispinosum</i> , 1942a	Name Valid
<i>N. elongatum</i> , 1942a	Name Valid
<i>N. microcollis</i> , 1942a	<i>N. brevitarso</i> (Krøyer)

Table 1.—Continued.

Hilton's species name	Present designation
<i>N. microsetosum</i> , 1942a	Name Valid
<i>N. molum</i> , 1942a	Name Valid
<i>N. nigroanathum</i> , 1942a	<i>N. grossipes</i> (Krøyer)
<i>N. noctum</i> , 1942a	<i>N. profundum</i> Hilton
<i>N. oculospinum</i> , 1942a	<i>N. grossipes</i> (Krøyer)
<i>N. profundum</i> , 1942a	Name Valid
<i>N. variatum</i> , 1942a	<i>N. pixellae</i> Scott
Callipallenidae:	
<i>Callipallene ovigerosetosa</i> , 1942c	(see <i>Oropallene o.</i>)
<i>Clotenopsa prima</i> , 1942d	<i>Pigrogromitus timsanus</i> Calman
<i>Cordylochele microspines</i> , 1942c	<i>Pseudopallene circularis</i> (Goodsir)
<i>C. setospines</i> , 1942c	<i>P. circularis</i> (Goodsir)
<i>Decachela discata</i> , 1939a	Name Valid
<i>Oropallene heterodonta</i> , 1942c	<i>Anoropallene palpida</i> (Hilton)
<i>O. (Pallene) ovigerosetosus</i> , 1942d	Callipallenid?
<i>O. palpida</i> , 1942c	<i>Anoropallene palpida</i> (Hilton)
<i>Pallenopsis oculotuberculosis</i> , 1942c	Name Valid
<i>P. pacifica</i> , 1942c	Name Valid
<i>P. profundis</i> , 1942c	Name Valid
<i>P. truncatum</i> , 1942d	? <i>Anoplodactylus pycnosoma</i> (Helfer)
<i>Pseudopallene setosa</i> , 1942c	<i>P. circularis</i> (Goodsir)
<i>P. spinosa</i> , 1942c	<i>P. circularis</i> (Goodsir)

Methods.—For uniformity of references and to avoid repetition, the letter suffixes next to the dates of Hilton’s publications correspond to the same letter suffixes of his complete list of publications in Child’s (1975) first paper. The literature citations in that paper will only be repeated in this report where they apply. Other papers treating the species discussed and published later by other authors are included. The type catalog numbers are those of the system used by the U.S. National Museum (USNM) and are retained for convenience.

Family Ammotheidae Dohrn, 1881
Genus *Achelia* Hodge, 1864
Achelia simplissima (Hilton)

Fig. 1

Ammothea simplissima Hilton, 1939a:31–32.—Hedgpeth, 1941:256 [key].
Ammothea simplisicma [sic] Hilton, 1942g:94.
Achelia simplissima.—Hedgpeth, 1951:106, 108; 1964:208 [key], fig. 94e.

Material examined.—Dillon Beach, Marin County, California, on bryozoans, coll. O. Hartman, 20 Dec 1934, USNM 81523 (1 ♀ syntype, 1 ♂ juvenile syntype).

Distribution.—This elusive species is only known from the adult and chelate juvenile syntypes from Dillon Beach, just north of San Francisco. No depth was given, but it was probably shallow or littoral.

Description.—(Female.) Species very small, trunk ovoid, unsegmented, with few short spines on anterior rim of cephalic segment. Lateral processes contiguous, without large distal tubercles, with lateral row of short dorsodistal spines, anterior spine of each segment on low inconspicuous tubercle. Ocular tubercle low (squashed down on holotype), without apical cone, eyes small, prominent. Abdomen carried almost horizontally, extending just beyond rim of first coxae of fourth leg pair, armed with three short dorsodistal spines. Proboscis moderately inflated (slightly squashed in holotype) little shorter than trunk, oral surface flat.

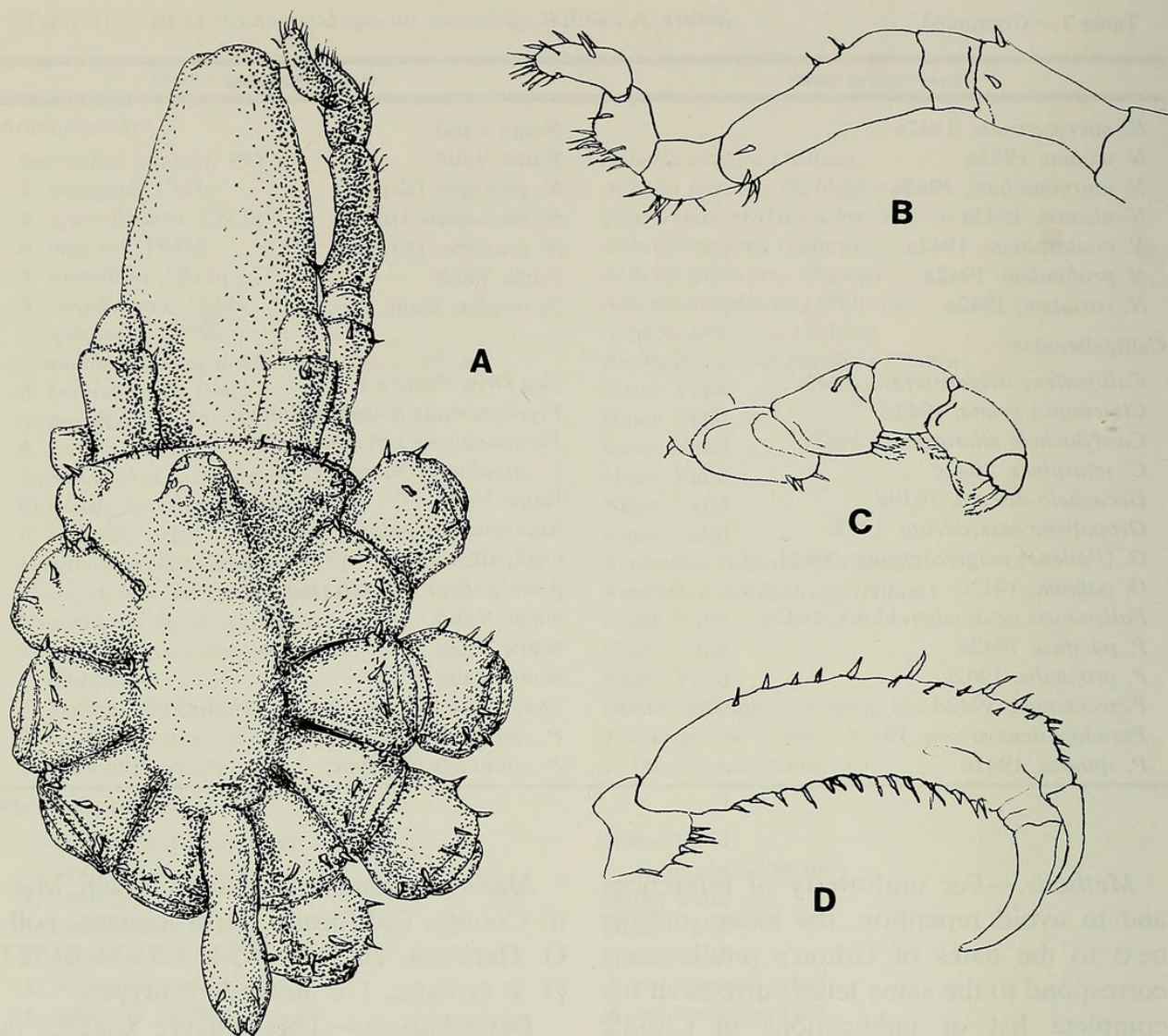


Fig. 1. *Achelia simplissima* (Hilton), holotype female: A, trunk, dorsal view; B, palp; C, oviger terminal segments, enlarged; D, distal leg segments, enlarged.

Chelifore scapes broad cylinders, short, only twice as long as their diameters, with one short dorsodistal spine. Chelae rounded bumps with distal cleft marking residual finger separation, without spines. Palps seven-segmented, third very short, not half as long as wide, fourth longest, with tuft of four or five short ventrodiscal spines. Distal three segments with fields of ventral spines; fifth a bent cylinder, sixth with triangular ventral tubercle, seventh long, curved, suggesting two coalesced segments. Oviger segments short, fifth little longer than fourth, strigilis segments little longer than wide, each armed with two short denticulate

spines, spines with six or seven lateral lobes.

Legs robust, femora inflated, without dorsodistal tubercles, second tibiae the longest segments, all segments armed with randomly placed short spines. First coxae without tubercles, with row of spines matching those of lateral processes. Tarsus without broad ventral spine, propodus with three slightly larger heel spines, many smaller sole spines, and slightly narrow, well curved main claw. Auxiliaries narrow, about half main claw length.

Male characters unknown.

Measurements.—Female syntype in mm:

Trunk length (chelifore insertion to tip 4th lateral processes), 0.98; trunk width (across 2nd lateral processes), 0.92; proboscis length, 0.93; abdomen length, 0.41; third leg, tarsus, 0.15; propodus, 0.61; main claw, 0.23.

Remarks.—The two specimens are in good condition but the ocular tubercle of the adult female has been flattened under cover glass, and the proboscis is slightly flattened.

This species is similar to *Achelia ovo-setosa* (Hilton, 1942g) (see Child 1995, for description and figures), which has short trunk and appendage spines in the same places as this species, but the former species has many more spines than *A. simplissima*. The chelifores of *A. ovo-setosa* are as broad but are shorter and the chelae are larger and longer in this species. The major difference between these two species is in the distal palps which have four bulbous segments and many longer setae in *A. ovo-setosa*. There are only three distal segments (third and fourth coalesced?) with fewer spines and the terminal segment is a narrow curved cylinder in *A. simplissima*. The size of *A. ovo-setosa* is approximately twice as large as *A. simplissima*, although size alone is not diagnostic. There are also other minor differences in oviger segment length and strigilis spination in the types of the two species, both of which are female.

Achelia spinoseta (Hilton)

Fig. 2

Ammothea spinoseta Hilton, 1939a:31; 1942g:95.—Hedgpeth, 1941:256 [key].

Achelia spinoseta.—Hedgpeth, 1951:106; 1964:208, fig. 94d.

Material examined.—Moss Beach, S of San Francisco, California, coll. W. Lewis, 8 Jul 1923, USNM 79427 (1 ♂ holotype).

Distribution.—This species has only been known from the unique holotype. No collecting depth was given, but it probably was taken in a shallow or littoral depth.

Description.—Size tiny, trunk unseg-

mented, with single seta at dorsolateral corners of cephalic segment. Lateral processes almost contiguous, some with tiny openings between, armed with pair of small dorso-lateral tubercles, the anterior ones with single short spine, the posterior tubercles with two, sometimes three short spines. Ocular tubercle a low cone (squashed flat in the type), eyes small, very inconspicuous. Abdomen carried almost horizontally, cylindrical, length extending to just short of distal rim on fourth coxae pair, armed with four short distal spines. Proboscis well inflated (squashed in type specimen), base very narrow, with narrow flat oral surface.

Chelifore scapes moderately broad, tapering distally, armed with small dorsodistal tubercle having three short spines. Chelae ovoid, half as long as scapes, armed with few very short lateral spines, with ventral cleft separating finger stubs. Palp eight-segmented, increasingly spinose distally, fifth, sixth, and seventh segments with conspicuous ventral lobes, terminal segment long, slender. Oviger second segment broader than distal segments, third as long as fourth, little longer than fifth, all three armed with short curved lateral spines, two rows on fifth segment. Sixth with few lateral spines, seventh with low lateral bulge having several longer spines. Strigilis distal three segments attached laterally to seventh, each armed with short ectal spine and short denticulate spines, one on eighth and ninth segments, two on tenth. Denticulate spines with seven-eight rounded lateral lobes.

Legs with conspicuous, randomly placed, long and short spines, none longer than segment diameters. First coxae with dorsolateral tubercles similar to those of lateral processes, armed with anterolateral and posterolateral row of short spines on tiny low tubercles. Second coxae with moderately long spines, coxae of posterior four legs with long ventrodistal tubercle as long as segment diameter, armed with few short spines. Third coxae shortest, armed with moderately long spines. Femur the longest segment, with few short spines and dorso-

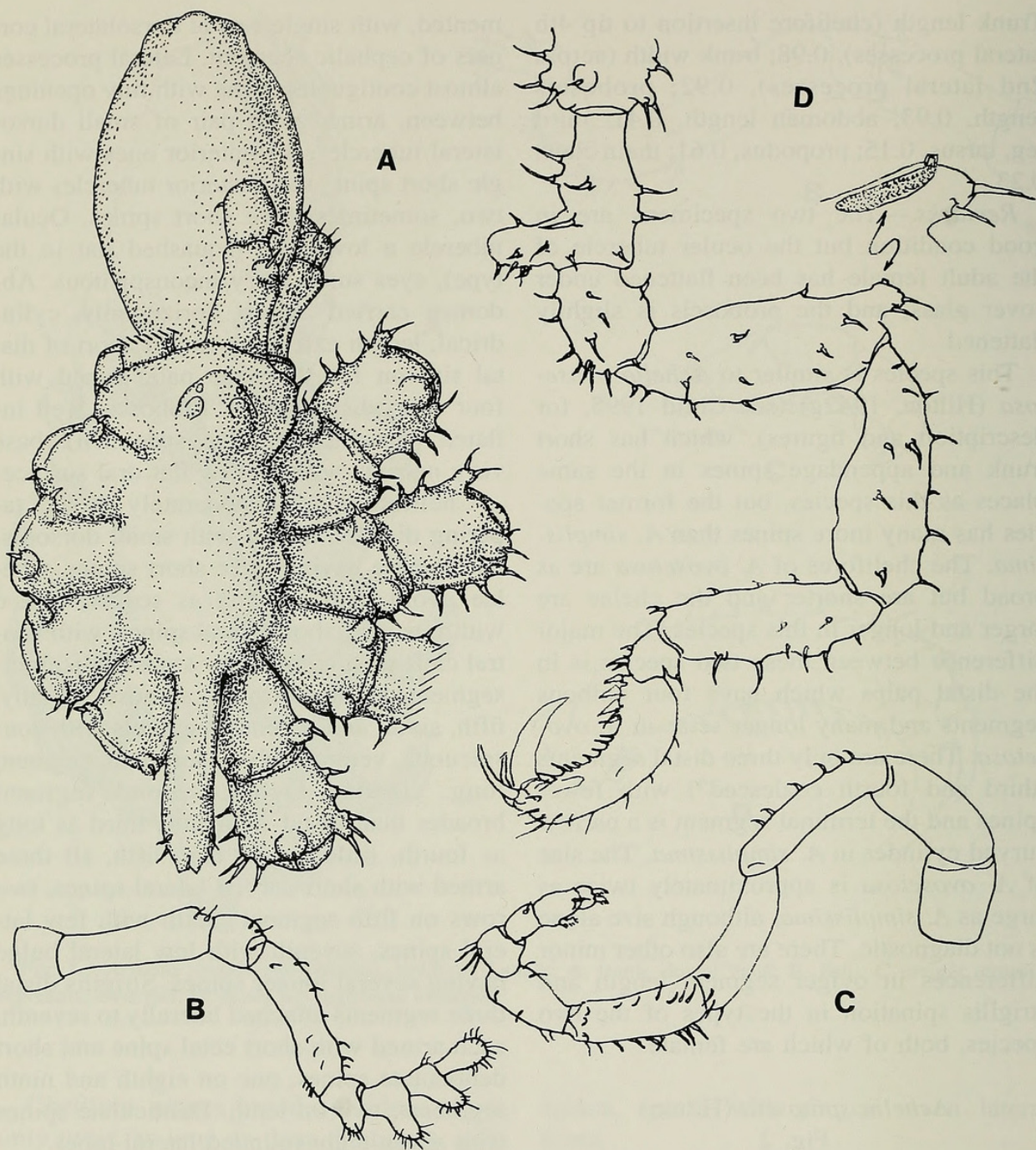


Fig. 2. *Achelia spinoseta* (Hilton), holotype male: A, trunk, dorsal view; B, third leg, with enlargement of cement gland and tube; C, palp; D, oviger.

distal tubercle bearing tiny short cement gland tube and two spines. Tibiae with few lateral and dorsal spines. Tarsus short, without prominent heel spine. Propodus well curved, with four larger heel spines, eight-nine smaller sole spines, and long slightly curved claw with auxiliaries approximately half main claw length.

Female characters unknown.

Measurements.—Holotype male in mm: Trunk length (chelifore insertion to tip 4th lateral processes), 1.19; trunk width (across 2nd lateral processes), 1.16; proboscis length (approximate), 0.98; abdomen length, 0.53; third leg, coxa 1, 0.28; coxa 2, 0.34; coxa 3, 0.3; femur, 0.77; tibia 1, 0.71; tibia 2, 0.67; tarsus, 0.15; propodus, 0.57; main claw, 0.3.

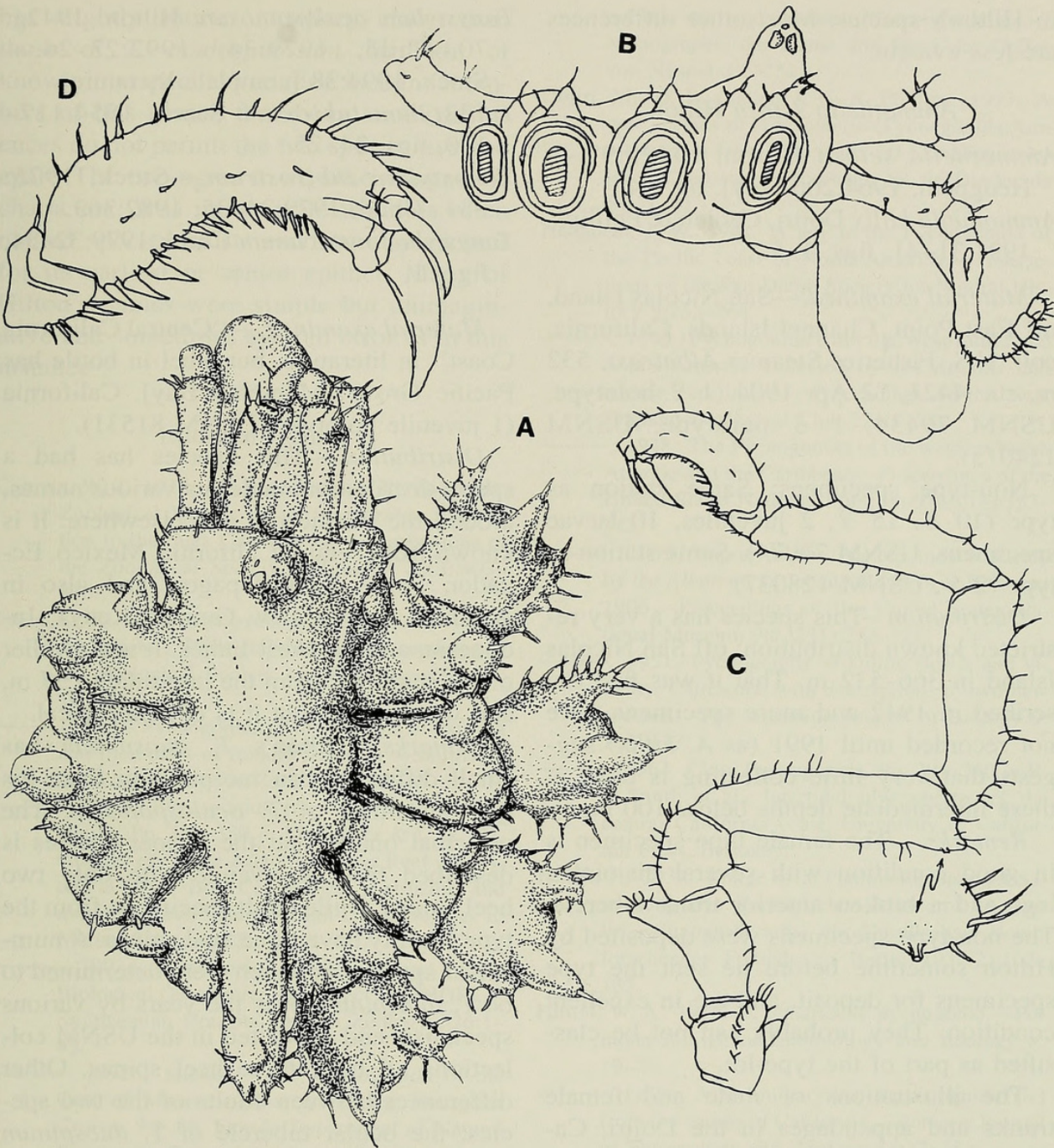


Fig. 3. *Achelia harrietae* Marcus, paratype male: A, trunk, dorsal view; B, trunk, lateral view; C, third leg, with enlargement of cement gland tube; D, distal leg segments, enlarged.

Remarks.—The whole specimen is slightly flattened with the ocular tubercle receiving most damage. One oviger is missing and a palp and leg are separated. The specimen is closely related to *A. harrietae* Marcus, 1940 (Fig. 3 herein) which is very similar in most characters. Hilton's species differs from that of Marcus (Exline) in having ventrally serrate distal palp seg-

ments, and a shorter and wider proboscis. It has several segments which are shorter, including the scapes, and an ocular tubercle which is also placed more posterior on the cephalic segment. The second oviger segment is shorter, along with shorter major leg segments and second coxae ventral tubercles. The major difference, again, is in the distal palp segmentation with serrate lobes

in Hilton's species. Most other differences are less evident.

Ammothella setosa Hilton

Ammothella setosa Hilton, 1942g:97.—

Hedgpeth, 1964:206 [key], fig. 94i.

Ammothella killix Dojiri, Cadien & Phillips, 1991:31–41, figs. 1–5.

Material examined.—San Nicolas Island, off East Point, Channel Islands, California, coll. U.S. Fisheries Steamer *Albatross*, 532 m, sta. 4421, 12 Apr 1904 (1 ♀ holotype, USNM 79434, 1 ♂ paratype, USNM 124015).

Non-type specimens: Same station as type (10 ♂, 15 ♀, 2 juveniles, 10 larvae specimens, USNM 77074). Same station as type (2 ♀, USNM 128037).

Distribution.—This species has a very restricted known distribution; off San Nicolas Island in 366–532 m. That it was first described in 1942 and more specimens were not recorded until 1991 (as *A. killix*) suggests that very little collecting is done at these intermediate depths below 100 m.

Remarks.—The female type specimen is in good condition with several disjointed legs and a broken anterior trunk tubercle. The non-type specimens were deposited by Hilton sometime before he sent the type specimens for deposit, and are in excellent condition. They probably can not be classified as part of the type-lot.

The illustrations of male and female trunks and appendages in the Dojiri, Cadien, and Phillips report are among the finest to be found in any paper on pycnogonid systematics since the time when monographs were elaborately illustrated by professional artists in the last century. They will serve well to display all the mysteries of this species which Hilton never illustrated.

Tanystylum duospinum Hilton

Tanystylum duospinum Hilton, 1939a:33; 1942e:69.—Hedgpeth, 1941:255 [key]; 1964:209 [key], fig. 96b.

Tanystylum oculospinosum Hilton, 1942g:70.—Child, 1979:34; 1992:23–24.—Stock, 1994:38 [complete literature].

Tanystylum tubirostre Stock, 1954:117–120, figs. 24, 25.

Tanystylum tubirostrum.—Stock, 1975:984.—Child, 1979:34–35; 1982:363.

Tanystylum mexicanum Child, 1979:32–34, fig. 11.

Material examined.—“Central California Coast” in literature, but label in bottle has Pacific Grove [Monterey Bay], California (1 juvenile holotype, USNM 81531).

Distribution.—This species has had a spotty distribution, under its various names, around the Pacific rim and elsewhere. It is known from central California, Mexico, Ecuador, Peru, the Galapagos, and also in Australia, Papua New Guinea, Kenya, Indonesia, and the West Indies. It is a dweller of the shallows, from the intertidal to 37 m, and with little doubt it is circumtropical.

Remarks.—Hilton's *T. duospinum* has small differences in morphology from his type specimen of *T. oculospinosum*. The principal one is that the former species is described from a juvenile with only two heel spines, while adult specimens from the type locality have three heel spines. A number of specimens which were determined to be *T. duospinum* over the years by various specialists and deposited in the USNM collections all have three heel spines. Other differences between adults of the two species: the ocular tubercle of *T. duospinum* has an apical cone while the other species does not, and the oviger denticulate spines of *T. duospinum* have finely serrate edges over most of their length while those of his other species appear to have only distal serrations. There are several small differences in the legs of male specimens. In *T. duospinum*, the first coxae of the anterior pair of legs has three distal tubercles while the first coxae pair of *T. oculospinosum* lack the posterior tubercle. The dorsodistal bulge or tubercle carrying the cement gland tube is larger and longer in *T. duospinum*, and it

has slightly shorter auxiliary claws than those of *T. oculospinosum*. In light of known interspecific variation in some members of this genus, the above small differences do not permit the two species to stand apart. The two agree in all other diagnostic characters. It is unfortunate that this often named species must resort to a misnomer for its earliest or senior epithet. Many of Hilton's names were simple but unimaginative and sometimes even in error as in this instance.

Literature Cited

- Calman, W. T. 1927. 28. Report on the Pycnogonida. Zoological Results of the Cambridge Expedition to the Suez Canal, 1924.—Transactions of the Zoological Society of London 22(3):403–410.
- Child, C. A. 1975. The pycnogonid types of William A. Hilton. I. Phoxichilidiidae.—Proceedings of the Biological Society of Washington 88(19): 189–210.
- . 1979. Pycnogonida of the Isthmus of Panama and the coasts of middle America.—Smithsonian Contributions to Zoology 293:1–86.
- . 1982. Pycnogonida from Carrie Bow Cay, Belize. Pp. 355–380 in K. Rutzler & I. G. Macintyre, eds., The Atlantic Barrier Reef ecosystem at Carrie Bow Cay, Belize, 1: structure and communities.—Smithsonian Contributions to Marine Sciences 12.
- . 1992a. Pycnogonida of the Southeast Pacific Biological Oceanographic Project (SEPBOB).—Smithsonian Contributions to Zoology 526:1–43.
- . 1992b. Shallow-water Pycnogonida of the Gulf of Mexico.—Memoirs of the Hourglass Cruises 9:1–86. Florida Department of Natural Resources, Bureau of Marine Research, January, 1992.
- . 1994. Deep-sea Pycnogonida from the temperate west coast of the United States.—Smithsonian Contributions to Zoology 556:1–23.
- . 1995. Pycnogonida of the western Pacific islands, XI. Collections from the Aleutians and other Bering Sea Islands Alaska.—Smithsonian Contributions to Zoology 569:1–30.
- , & J. W. Hedgpeth. 1971. Pycnogonida of the Galapagos Islands.—Journal of Natural History 5:609–634.
- Cole, L. J. 1904. Pycnogonida of the west coast of North America.—Harriman Alaska Expedition 10:249–330.
- Dohrn, A. 1881. Die Pantopoden des Golfes von Neapel und der angrenzenden Meeresabschnitte.—Monographie der Fauna und Flora des Golfes von Neapel 3:1–252.
- Dojiri, M., D. B. Cadien & C. A. Phillips. 1991. A new species of *Ammothella* (Pycnogonida: Ammotheidae) from deep water off San Nicolas Island, California.—Bijdragen tot de Dierkunde 61:31–41.
- Hedgpeth, J. W. 1941. A key to the Pycnogonida of the Pacific coast of North America.—Transactions of the San Diego Society for Natural History 9:253–264.
- . 1943. Pycnogonida from the West Indies and South America collected by the *Atlantis* and earlier expeditions.—Proceedings of the New England Zoological Club 22:41–58.
- . 1948. The Pycnogonida of the western North Atlantic and the Caribbean.—Proceedings of the United States National Museum 97(3216):157–342.
- . 1949. Report on the Pycnogonida collected by the *Albatross* in Japanese waters in 1900 and 1906.—Proceedings of the United States National Museum 98(3231):233–321.
- . 1951. Pycnogonids of Dillon Beach and vicinity, California, with descriptions of two new species.—The Wasmann Journal of Biology 9: 105–117.
- . 1964. Class Pycnogonida. Pp. 201–210 in R. I. Smith et al., Intertidal invertebrates of the central California coast, University of California Press, Berkeley.
- Helfer, H. 1938. Einige neue Pantopoden aus der Sammlung des Zoologischen Museums in Berlin.—Sitzungsberichte der Gesellschaft Naturforschender Freunde zu Berlin 1937(2):162–185.
- Hilton, W. A. 1916. A remarkable pycnogonid.—Pomona Journal of Entomology and Zoology 8: 19–24.
- . 1939a. A preliminary list of pycnogonids [sic] from the shores of California.—Pomona Journal of Entomology and Zoology 31:27–35.
- . 1942a. Pantopoda chiefly from the Pacific. 1—Nymphonidae.—Pomona Journal of Entomology and Zoology 34:3–7.
- . 1942b. Pycnogonids from Allan Hancock Expeditions.—Allan Hancock Pacific Expeditions 5(9):277–339.
- . 1942c. Pantopoda (Continued). II—Family Callipallenidae.—Pomona Journal of Entomology and Zoology 34:38–41.
- . 1942d. Pycnogonids from Hawaii.—Occasional Papers from the Bernice P. Bishop Museum 17(3):43–55.
- . 1942e. Pycnogonids from the Pacific. Family Tanystylidae.—Pomona Journal of Entomology and Zoology 34:69–70.

- . 1942f. Pycnogonids from the Pacific. Family Phoxichilidae [sic] Sars 1891.—*Pomona Journal of Entomology and Zoology* 34:71–74.
- . 1942g. Pycnogonids from the Pacific. Family Ammotheidae.—*Pomona Journal of Entomology and Zoology* 34:93–99.
- . 1943a. Pycnogonids from the Pacific. Family Colossendeidae.—*Pomona Journal of Entomology and Zoology* 35:2–4.
- . 1943b. Pycnogonids from the Pacific. Family Pycnogonidae. Family Endeidae.—*Pomona Journal of Entomology and Zoology* 35:19.
- Hodge, G. 1864. List of British Pycnogonidea, with descriptions of several new species.—*Annals and Magazine of Natural History* (3)13:113–117.
- Lebour, M. V. 1945. Notes on the Pycnogonida of Plymouth.—*Journal of the Marine Biological Association of the United Kingdom* 26:139–165.
- Marcus, E. 1940. Os Pantopoda brasileiros e os demais sul-americanos.—*Boletim da Faculdade de Filosofia, Ciências e Letras da Universidade de São Paulo* 19 (Zool. #4):3–179.
- Stock, J. H. 1954. Four new *Tanystylum* species, and other Pycnogonida from the West Indies.—*Studies on the Fauna of Curaçao* 5(24):115–129.
- . 1956. Pantopoden aus dem Zoologischen Museum Hamburg, 1 (= I–III).—*Mitteilungen aus dem Zoologischen Museum in Hamburg* 54:33–48.
- . 1975. Pycnogonida from the continental shelf, slope, and deep sea of the tropical Atlantic and East Pacific. Biological results of the University of Miami deep-sea expeditions, 108.—*Bulletin of Marine Science* 24:957–1092.
- . 1994. Indo-West Pacific Pycnogonida collected by some major oceanographic expeditions.—*Beaufortia* 44:17–77.
- Wilson, E. B. 1881. Report on the Pycnogonida. Reports on the results of dredging . . . Blake.—*Bulletin of the Museum of Comparative Zoology, Harvard [Massachusetts]* 8(12):239–256.



Child, C. Allan. 1996. "The Pycnogonida Types Of William A. Hilton .2. The Remaining Undescribed Species." *Proceedings of the Biological Society of Washington* 109, 677–686.

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