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ACICONULA ACANTHOSOMA, NEW SPECIES, A CAPRELLID AMPHIPOD FROM SOUTHERN CALIFORNIA, WITH NOTES ON ITS ECOLOGY

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ABSTRACT

A caprellid amphipod, *Aciconula acanthosoma*, new species, is described from nearshore waters of Santa Catalina Island, California. Previously the genus *Aciconula* was monotypic, known only from the western Pacific species *A. miranda*. The new species was common and persistent during 15 years of sampling, and was found on 12 types of substrata and in the gut contents of eight species of fishes. It is distinguished from *A. miranda* primarily by the spination of the head and pereionites.

During studies of nearshore marine communities at Santa Catalina Island in southern California, I collected specimens of a caprellid amphipod referable to the genus *Aciconula*. It was common and persistent from 1973–1988 in samples from a variety of substrata, and in the gut contents of fishes. Subsequent study showed that these specimens differ from the unique type species *A. miranda* Mayer, 1903, known from six specimens from widely separated localities in the western Pacific Ocean (Arimoto, 1971). The new species is described herein.

Aciconula acanthosoma, new species
Figs. 1, 2

Type Material.—Holotype male, length 7.3 mm, on *Cystoseira neglecta* Setchell and Gardiner, 1917, depth 11 m, Isthmus Reef, Santa Catalina Island, California (33°23'N, 118°30.5'W), 25 August 1981, J. R. Chess collector, deposited in the National Museum of Natural History, Smithsonian Institution, Washington D.C., USNM 240206. Allotype female, length 6.2 mm, locality as for holotype, USNM 240207. Ten paratypes, locality as for holotype, USNM 240208.

Locality Records.—Large numbers of specimens were collected from several sites on the leeward side of Santa Catalina Island, primarily from Isthmus Reef, depth 11–14 m. Other Santa Catalina Island sites included Fisherman's Cove, depth 8 m; Lions Head Point, depth 12 m; and West End Point, depth 7 m. This amphipod was also reported from San Clemente Island (33°00'N, 118°33'W), depth and collection site unknown (Bruce Benedict, Marine Biological Consultants, Costa Mesa, California, personal communication, 1973).

Other Material.—30 specimens, 4.0–7.6 mm, from Isthmus Reef, Santa Catalina Island, California, 25 August 1981.

Diagnosis.—A species of *Aciconula* which has the following features: head with 4 prominent curved spines; all pereionites dorsally spinose; flagellum of antenna 1 with 10–12 articles; basis of gnathopod 2 with acute distolateral projection.

Description.—Male (length to 7.6 mm): Body dorsally spinose, 1 pair of spines on each pereionite flaring bilaterally; ventrolateral margins of pereionites 2–5 expanded laterally, spinose; pereionite 3 somewhat elongate, 2, 4, and 5 shorter and subequal. Antenna 1, flagellum with 12 articles. Antenna 2 exceeding peduncle of antenna 1; flagellum weakly setose, with 2 articles. Mandibular palp with 3 articles; terminal article with distal row of 8 blunt knobs and parallel row of 6 even spines with longer spine at each end. Mandibular molar large and ridged; lacinia mobilis of left mandible 5-denticulate, lacinia of right setulose, incisor strongly denticulate. Maxilla 1 endite with 6 terminal spines, palp with 4 terminal spines and single lateral seta. Maxilla 2 with few apical setae. Maxilliped inner lobe smaller than outer lobe and with 1 short tooth and 3 setae distally, palp article 4 with distal row of 5 setae. Gnathopod 1, propodus with 2 proximal grasping spines; propodus and carpus each with distal row of 6 setae on medial surface. Gnathopod 2, palmar surface of propodus with 2 distal triangular projections and medial excavation, bordered proximally by strong spine, proximal surface with row of fine blunt serrations and single grasping spine; basis with acute distolateral projection. Pereiopods 3 and 4 with 2 articles, article 2 of each conical, about one-half length of first, with 3 plumose apical setae. Pereionites 3 and 4 with gills. Pereiopod 5 unusual for caprellids but typical of genus, with 6 soft, flexible articles; articles 4 and 5 conspicuously setose, article 6 minute, none with grasping structures. Pereiopods 6 and 7 with 7 arti-

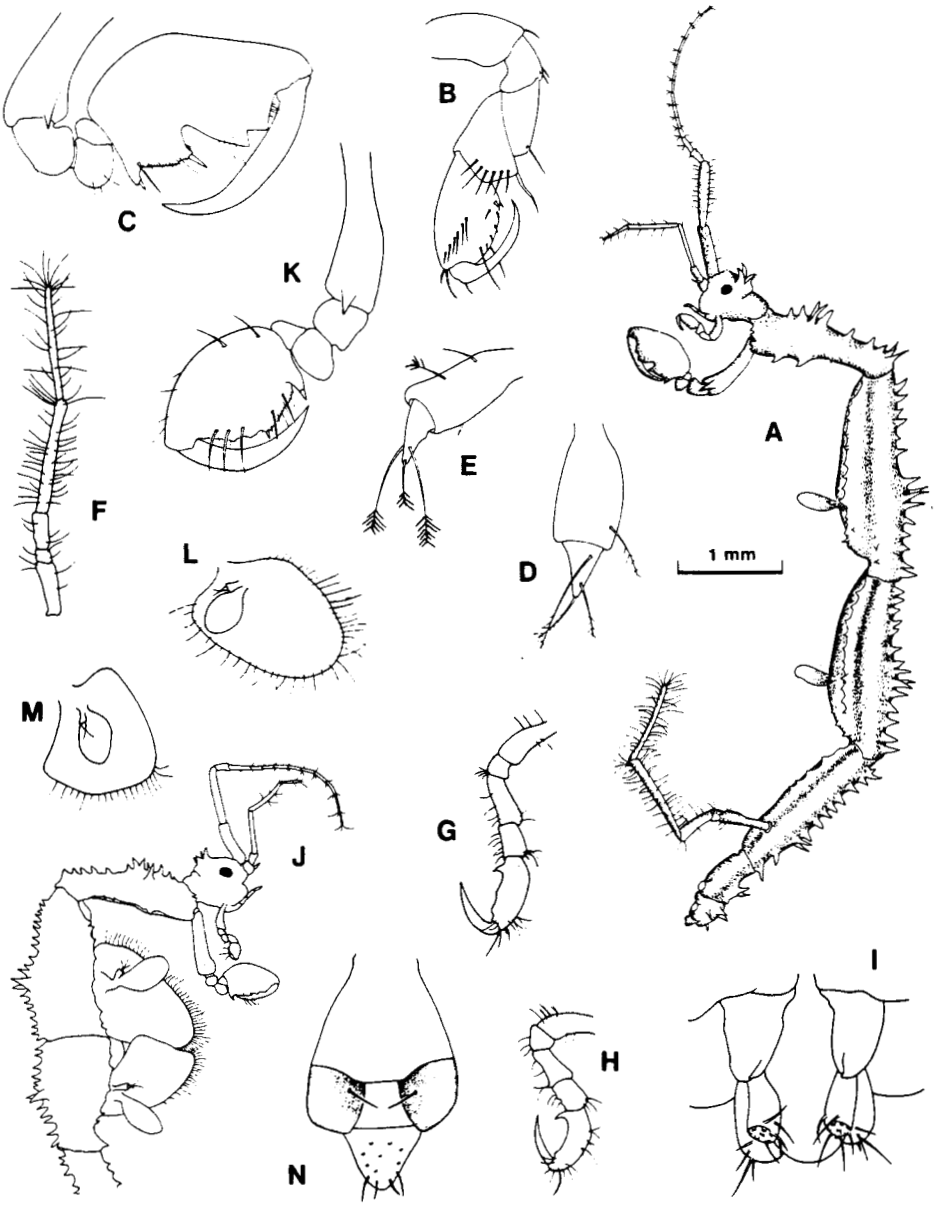

Fig. 1. *Aciconula acanthosoma*, new species, holotype, A–I, adult male. A, whole animal; B, gnathopod 1, medial view; C, gnathopod 2; D–H, pereiopods 3–7; I, abdomen. Allotype, J–N, adult female. J, anterior pereionites; K, gnathopod 2; L, M, oostegite, gill, pereiopods 3 and 4; N, abdomen.

cles, propodus of each with 1 pair of proximal grasping spines. Abdomen with penes lateral; distal end of appendages abruptly truncate with short multitipped terminal spines.

Female (length to 6.3 mm): Similar to male in spination and pereionite lengths. Antenna 1 with 10 articles; gnathopod 2 as figured; abdomen with 1 pair of posteriorly truncate lobes, each with medially directed seta, terminal protuberance punctate with 4 posterior setae.

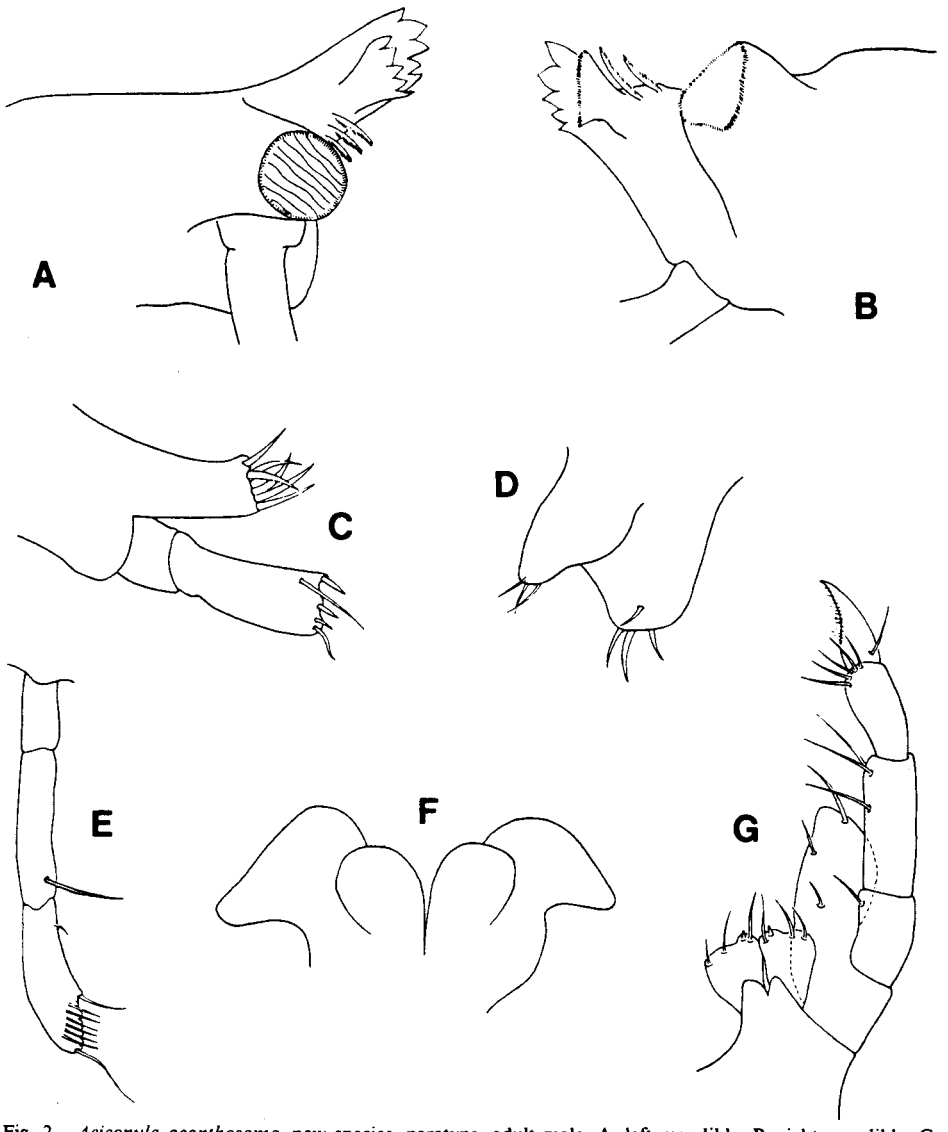

Fig. 2. *Aciconula acanthosoma*, new species, paratype, adult male. A, left mandible; B, right mandible; C, maxilla 1; D, maxilla 2; E, mandibular palp; F, lower lip; G, maxilliped.

Etymology.—From the Greek *acantha* meaning spine or thorn and *soma* denoting body.

Remarks.—*Aciconula acanthosoma* differs from *A. miranda* by the extensive spination of its head and pereion; by the inner lobe of the maxilliped being truncate and spinose, by the presence of the distal row of setae on article 4, and the setal formula 1:6:1 rather than 1:7:1 of the terminal article of the maxillipedal palp, and by the subequal lengths of pereiopods 3 and 4 (in *A. miranda* pereiopod 3 is approximately 3× the length of pereiopod 4).

Systematics.—McCain (1970) tentatively placed the genus *Aciconula* in the subfamily Protellinae within the Aeginellidae. His uncertainty arose from the lack of an appropriate description of the mandible of the type species. The presence of a mandibular

molar, as well as the remaining characters of the Aeginellidae (the presence of a mandibular palp, reduced pereiopods 3 and 4, gills on pereionites 3 and 4, and an abdomen of a single reduced article) confirms his suspicion and allows familial placement of this genus.

Aciconula Mayer, 1903, was emended by Arimoto (1971) where he included several characters not considered in Mayer's original description. *Aciconula acanthosoma* conforms to all generic characters mentioned by Arimoto except the setal formula of the terminal article of the mandibular palp. This character does not constitute a generic difference.

Ecology.—*Aciconula acanthosoma* was found off the leeward (northern) shore of Santa Catalina Island within nearshore habitats that are protected from prevailing oceanic swells. The visually dominant feature of these habitats is narrow fringing beds of giant kelp, *Macrocystis pyrifera* (Linnaeus, 1771), with a benthic understory of foliose algae. *Aciconula acanthosoma* was found on 12 different substrata (of 21 examined) including sand, rock, the bryozoan *Bugula neritina* Linnaeus, 1758, the green alga *Codium fragile* (Suringar, 1867), the brown algae *Cystoseira neglecta*, *Desmarestia viridis* (Müller, 1782), *Dictyopteris undulata* Holmes, 1896, *Pachydictyon coriaceum* (Holmes, 1896), *Sargassum muticum* (Yendo, 1907), *Sargassum palmeri* Grunow, 1915, and *Zonaria farlowii* Setchell and Gardiner, 1924, and the red alga *Plocamium cartilagineum* (Linnaeus, 1753). The highest densities of *A. acanthosoma* (up to 70 individuals/100 g of algae) were found on *Cystoseira neglecta* and *Sargassum palmeri*, both perennial phaeophytes with relatively slender branching thalli. In contrast, foliose phaeophytes with broader thalli, such as *Dictyopteris undulata* and *Zonaria farlowii*, usually had much lower densities, about 15% of the former.

Aciconula acanthosoma was present during all seasons but was most abundant in February and March. Interannual variations in abundance tended to be greater than seasonal variations, with the lowest numbers occurring during and following the El Niño events of 1976 and 1983.

Stomach content analysis of predatory fishes from Santa Catalina Island revealed that *A. acanthosoma* was not a major dietary component in any of the species analyzed, but occurred infrequently in the diets of the cottid *Orthanopias triacis* Starks and Mann, 1911, the embiotocid *Embiotoca jacksoni* Agassiz, 1854, the pomocentrid *Hypsypops rubicunda* (Girard, 1854), the labrids *Halichoeres semicinctus* (Ayres, 1859) and *Semicossyphus pulcher* (Ayres, 1854), the clinid blenny *Alloclinus holderi* (Lauderbach, 1907), and the gobies *Coryphopterus nicholsi* (Bean, 1881) and *Lythrypnus zebra* (Gilbert, 1890).

The feeding mode of *A. acanthosoma* was investigated by study of gut contents from eight specimens. The only recognizable structures found were spicules of sponges and ascidians presumably scraped from substrata. The absence of diatom frustules in the gut contents, coupled with lack of well-developed setae on its second antennae, suggest that the species is not primarily a filter feeder (Caine, 1974).

Brooding females were found from January to March and the number of eggs per clutch appeared to be size-correlated, with the larger individuals carrying up to 14 eggs.

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