Southern California Association of Marine Invertebrate Taxonomists

3720 Stephen White Drive
San Pedro, California 90731

January 1990 Vol. 8, No. 9

NEXT MEETING: Pagurid Meeting

GUEST SPEAKER: Janet Haig, Allan Hancock Foundation, University of Southern California

DATE: Monday, February 12, 1990, 9:30 AM

LOCATION: L.A. County Museum of Natural History
900 Exposition Blvd.
Los Angeles, CA 90007

MINUTES FROM MEETING ON JANUARY 8, 1990

Pagurid Workshop: Representatives from Hyperion Treatment Plant, Kinnetic Labs, MEC Analytical Systems, Marine Biological Consultants, Los Angeles County Sanitation Districts, Cabrillo Marine Museum, and Pt. Loma/City of San Diego met at the Cabrillo Marine Museum to discuss problems in taxonomic identification of the crustacean group Paguridea. These problems, once isolated, will then be presented to Janet Haig for possible solutions during the Pagurid Workshop. Don Cadien, LACSD, suggested using Mary K. Wicksten's "Artificial Key to Shallow-Water Hermit Crabs of California" for live specimens, and Janet Haig's "A Preliminary Key to the Hermit Crabs of California" for both live and preserved material. Eugene N. Kozloff's "Marine Invertebrates of the Pacific Northwest" can be utilized as an alternative key. A list of pagurid species identified from southern California, including synonymies, was compiled by Carol Paquette, MBC, and is included herein.

Several problems with Janet Haig's key were isolated:

Couplet 1: Illustrations of approximated versus widely separated maxilliped bases are needed. Without the figures, both character

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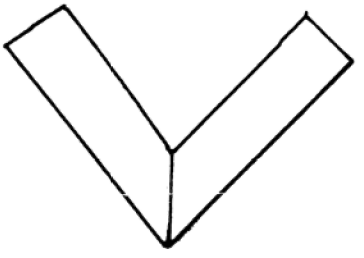
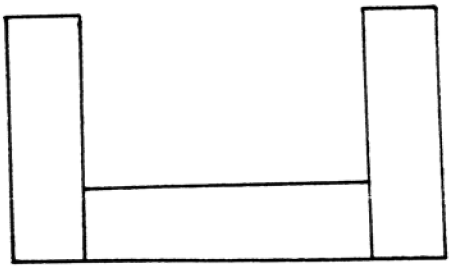
states need to be examined for comparative purposes. Rough schematic drawings of our interpretation are presented below.



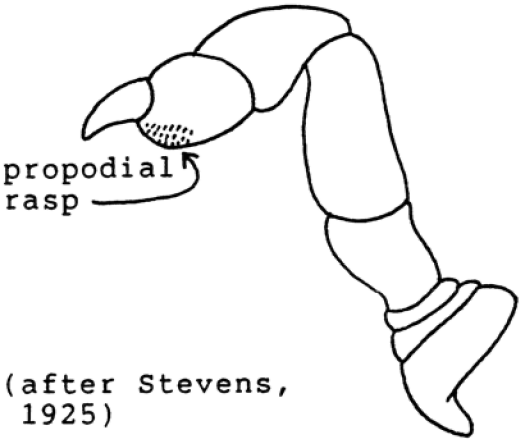
maxilliped bases
approximated



maxilliped bases
widely separated

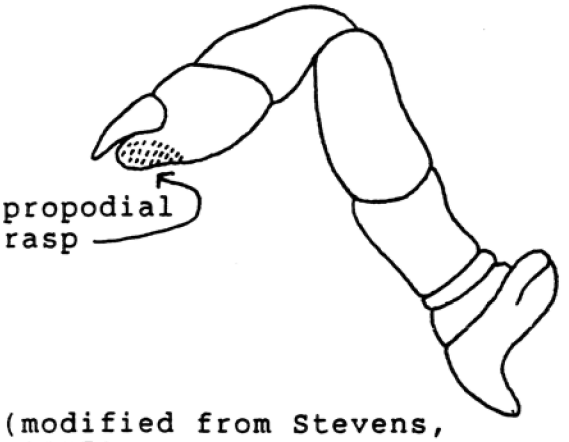
Couplet 2: The paired pleopods, if present, are located immediately posterior to the thorax, at the anteriormost portion of the abdomen. Carol Paquette has several specimens with numerous (more than two) pairs of pleopods in her collection. Since the couplet reads "Males with two pairs of pleopods, females with one pair...", these specimens can not be keyed further. Carol discovered that these specimens probably represent the first crab stage, which is often different in appearance from succeeding crab stages and may closely resemble the glaucothoe (megalopa) larval (final planktonic) stage (see attached figure of cf. Isocheles pilosus 1st crab stage). Don Cadien suggested that the key be changed with a beginning couplet to read "Abdomen symmetrical versus asymmetrical..."; this would distinguish the larval and 1st (and possibly 2nd) crab stages from the adults of the Paguridea. First crab stages have not been described or illustrated for West Coast species, and, at present, not much can be done with them. Patsy McLaughlin feels that Carol's specimen's are 1st crab stage I. pilosus, based on the position of the 3rd maxillipeds, weak development of the ocular acicles and sternite of P5, and equal pleopods (restricting it to the Diogenidae), and development of the dactyls and propodi of P4 (eliminating Paguristes). Carol has provided illustrations of adult Isocheles pilosus (attached to this newsletter).

Distinction between Isocheles and Paguristes: The fifth pair of legs in all members of the Diogenidae are subchelate. The fourth leg is also subchelate in Isocheles, but simple in Paguristes. Schmidt (1921) used this character in his key, but no subsequent author utilized these character states.



(after Stevens, 1925)

Paguristes (simple 4th pereopod; setation omitted)



(modified from Stevens, 1925)

Isocheles (subchelate 4th pereopod; setation omitted)

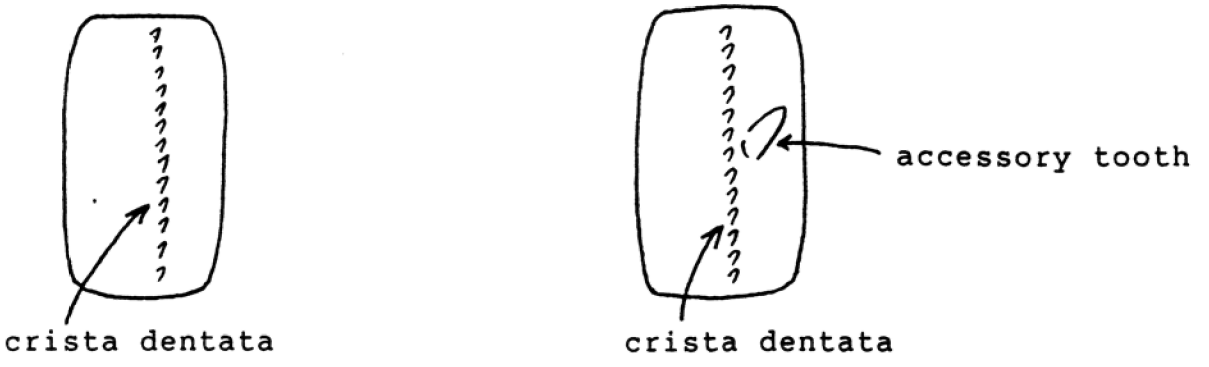
Paguristes undescribed species #1: Examination and preliminary illustrations of this species need to be done. This would give us a better impression of what is meant by a slender rostrum with a narrow base and a rostral tip reaching beyond the base of the eyescales.

Couplet 5: Illustrations of "chelae very broad, strongly convex on outer margin" versus "chelae relatively narrow, outer margin not strongly convex" need to be included. These character states are quite distinct once specimens of both Paguristes bakeri and P. turgidus are examined side by side. This couplet is, however, problematic for the novice taxonomist. Schematic illustrations are presented below.

P. bakeri: chelae very broad, strongly convex on outer margin

P. turgidus: chelae relatively narrow, outer margin not strongly convex

Couplet 7: Accessory tooth of crista dentata situated on the outer maxillipeds needs to be illustrated.



Couplet 8: An opercular cheliped is subcircular in outline and flat.

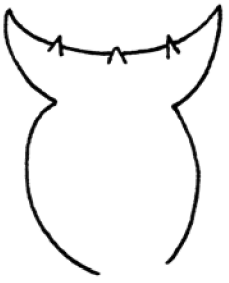
Couplets 9-11: No problems were encountered with these couplets; however, it is noted here that three species of Pylopagurus have been transferred to other genera by Patsy McLaughlin (1981). Only one species listed in this key, P. holmesi, is retained in this genus.

Couplet 12: If Orthopagurus minimus is in a coiled shell, the abdomen will not be straight, but the telson and uropods will still be subsymmetrical.

Couplet 13: This couplet pertains only to males. The distinction is the presence or absence of sexual tubes on the males. However, problems arise when attempting to identify female specimens using this key. Characters that distinguish the females need to be added in this couplet. Illustration of sexual tubes on the fifth leg should be provided.

Couplet 15: If the dorsal surface of the left chela is either convex or ridged, the chela is considered to be "elevated".

Couplet 16: The ornamentation of the posterior lobes of the telson need to be illustrated.



telson armed on terminal margins only

telson armed on terminal and lateral margins

Couplet 18: This couplet, which distinguishes the long slender spines of the chelae of Pagurus armatus from the moderately short, conical spines of Pagurus ochotensis, is difficult to use unless both species are examined at the same time. An alternative character that was suggested at the workshop is an acute (P. ochotensis) versus rounded (P. armatus) rostrum. McLaughlin's (1974) paper entitled "Northwest American Hermit Crabs" distinguished these two species by the ornamentation of the mesial surfaces of the left chela:

> ...palm and dactyl of left chela with mesial surfaces strongly armed with low spines or spinulous tubercles..P. ochotensis
>
> ...palm and dactyl of left chela with mesial surfaces usually unarmed or with irregular row of small spines or tubercles approximating dorsomesial margin.....P. armatus

SCAMIT Picnic: Larry Lovell, Vice-President of SCAMIT, asked the pagurid workshop participants whether or not to continue the Annual Picnic held at Doheny State Beach. Apparently, there is still some interest in the annual event which will be held again at Doheny on a Saturday, sometime in August. Tentative arrangements will be made to reserve the picnic spot for 1990.

Natural History Museum Research Seminars: A list of the seminars to be presented from January-March 1990 at the Los Angeles County Museum of Natural History is attached to this newsletter. Please note that all seminars are at 3:00 PM in the Times Mirror Room.

Job Opportunity in Long Beach: A research technician position is now available at the Southern California Coastal Water Research Project (SCCWRP) located in Long Beach. Refer to job announcement attached to this newsletter for details.

Nominations for SCAMIT Officers: It is again time to elect new SCAMIT officers. Please send your nominations for President, Vice-president, Secretary, and Treasurer to the current secretary:

Dr. Mas Dojiri
Biology Lab
Hyperion Treatment Plant
12000 Vista del Mar
Playa del Rey, CA
90293

A list of nominees and ballots will be sent in the February newsletter. Ballots will be tallied, and new officers announced in the March newsletter. New officers will formally take office shortly thereafter.

Cladistics Seminar and Workshop: A cladistics seminar will be presented at the Los Angeles County Museum of Natural History on Wednesday, 14 February 1990 by Dr. Kirk Fitzhugh, Thorne Fellow, American Museum of Natural History. Additionally, Kirk has graciously agreed to present a SCAMIT workshop on cladistics at LACM on Friday, 16 February, 10:00 AM. For further information, please call Leslie Harris at (213) 743-2085.

SCAMIT pagurids, 8 Jan 90 meeting

Pagurid species of southern California

Family Diogenidae

Isocheles Stimpson 1858

Isocheles pilosus (Holmes) 1900

San Francisco, CA, to Estero de Punta Banda, outer Baja
Intertidal to 55 m, on sand.
Ref: Holmes 1900: description.
Haig 1974?: key
Schmitt, 1921: description and plate figure.
Wicksten 1977: artificial key.
Scanland 1964?: (as *Holopagurus*) description, key and diagrammatic illustrations.
Forest 1964: Discussion; illustration of *I. pacificus* Bouvier.
Haig, Hopkins and Scanland 1970: discussion and key for Baja Calif.

Paguristes Dana 1851

Paguristes bakeri Holmes 1900

San Francisco, CA, to Gulf of California.
Shallow water to 232 m.
Ref: Holmes 1900: ?
Schmitt 1921: description and plate figures.
Glassell 1937: discussion.
Scanland 1964?: description, key and diagrammatic illustrations.
Haig 1974?: key.
Haig, Hopkins and Scanland 1970: discussion and key.

Paguristes parvus Holmes 1900

Catalina Island and San Pedro, CA, to northern outer Baja California.
3 to 6 m, rocky areas.
Ref: Holmes 1900: ?
Schmitt 1921: description, diagrammatic illustration and plate figure.
Scanland 1964?: description, key and diagrammatic illustration.
Haig, Hopkins and Scanland 1970: discussion and key.
Haig 1974?: key.
Wicksten 1977: artificial key.

Paguristes turgidus (Stimpson) 1857

Chukchi Sea and British Columbia to San Diego, CA.
Subtidal to 465 m.
Ref: Stimpson 1857: description (as *Clibanarius*)
Schmitt 1921: description and plate figures.
Stevens 1925: description, key and illustrations (whole body).
Scanland 1964?: description, key and diagrammatic illustration.
Hart 1971: range extension.
Haig 1974?: key.
McLaughlin 1974: description, key and illustrations.
Wicksten 1977: artificial key.
Kozloff 1987: key.

Pagurus capillatus (Benedict) 1892
Arctic Ocean to Kamchatka and California.
4 to 439 m.
Ref: Benedict 1892: description (as *Eupagurus*).
Schmitt 1921: description and illustrations (chela and anterior body).
Stevens 1925: (as *P. setosus*) description, key and illustration (whole body).
Makarov 1938: description.
Hart 1971: range extension.
Haig 1974?: key.
McLaughlin 1974: description, key and illustrations.
Kozloff 1987: key and illustration (whole body).

Pagurus caurinus Hart 1971
Kodiak, Alaska, to British Columbia.
Littoral to 126 m, rock crevices or kelp holdfasts.
Ref: Hart 1971: description and illustrations (incl. whole body).
Haig 1974?: key.
Wicksten 1977: artificial key.
Kozloff 1987: key.

Pagurus granosimanus (Stimpson) 1858
Unalaska to Ensenada, Baja Calif.
Littoral to 32 m
Ref: Schmitt 1921: description and illustration (whole body).
Stevens 1925: description, key and illustration (whole body).
Makarov 1938: description.
Scanland 1964?: description, key and diagrammatic illustration.
Haig 1974?: key.
McLaughlin 1974: description, key and illustrations.
Wicksten 1977: artificial key.
Kozloff 1987: key and illustration (whole body).

Pagurus hemphilli (Benedict) 1892
British Columbia to Monterey, CA.
Intertidal to ?
Ref: Benedict 1892: description (as *Eupagurus*).
Schmitt 1921: description and illustration (whole body).
Hart 1971: range extension.
Haig 1974?: key.
McLaughlin 1974: description, key and illustrations.
Wicksten 1977: artificial key.
Kozloff 1987: key.

Pagurus samuelis (Stimpson) 1857
British Columbia to outer Baja California (Rathbun's report from Sitka, Alaska, is a misidentification of *P. hirsutiusculus*).
High intertidal to ?
Ref: Stimpson 1957: description (as *Eupagurus*).
Stimpson 1858: (as *Eupagurus*) description (in Latin). Schmitt 1921, description, illustration (whole body male and female) and plate figures.
Makarov 1938, description
Scanland 1964?: description, key and diagrammatic illustration.
Hart 1971: range extension.
Haig 1974?: key.
McLaughlin 1974: description, key and illustrations.
Wicksten 1977: artificial key.
Kozloff 1987: key.

Pagurus setosus (Benedict) 1892
Kodiak, Alaska, to Santa Cruz Island, CA.
9 to 480 m.
Ref: Benedict 1892: description (as *Eupagurus*).
Schmitt 1921: description and illustration (whole body).
Makarov 1938: description and illustration (whole body).
Haig 1974?: key.
McLaughlin 1974: description, key and illustrations.
Kozloff 1987: key.
not Stevens 1925.

Pagurus spilocarpus Haig 1977
Zuma Beach, CA, to Punta Abreojos, Baja Calif.
Low tide to 71 m.
Ref: Haig 1974?: (as *P.* sp. 1) key.
Haig 1977: description and illustrations.
Wicksten 1977: (as *P.* sp. 1)

Pagurus tanneri (Benedict) 1892
Pribilof Islands, Alaska, to San Simeon, CA.
87 to 1120 m.
Ref: Benedict 1892: description (as *Eupagurus*).
Schmitt 1921: description and illustration (whole body).
Makarov 1938: description.
Hart 1971: range extension.
Haig 1974?: key.
McLaughlin 1974: description, key and illustrations.
Kozloff 1987: key and illustration (whole body).

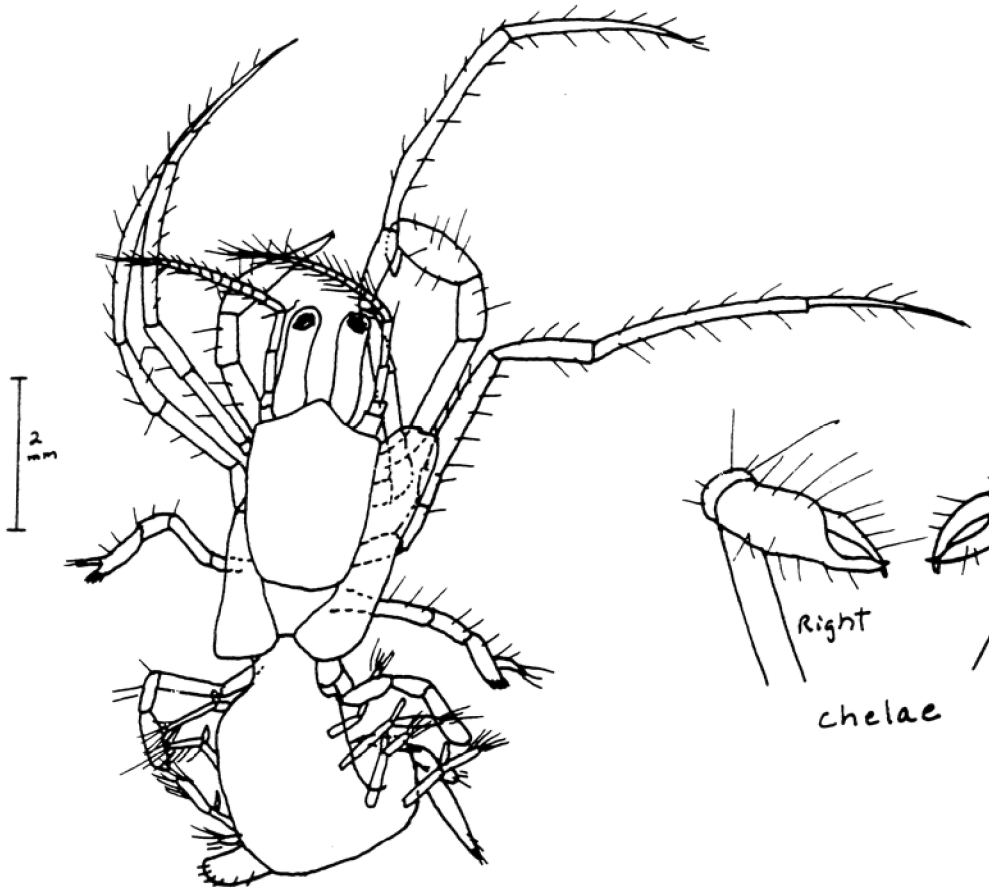
Pagurus sp. 2 (Haig MS)
Southern Baja Calif.
106 to 116 m.
Ref: is this *P.* sp.2 of Haig, Hopkins and Scanland 1970?
Haig 1974?: key.
Wicksten 1977: artificial key.

Pagurus sp. 4 (Hart MS)
Ref: Haig 1974?: key.

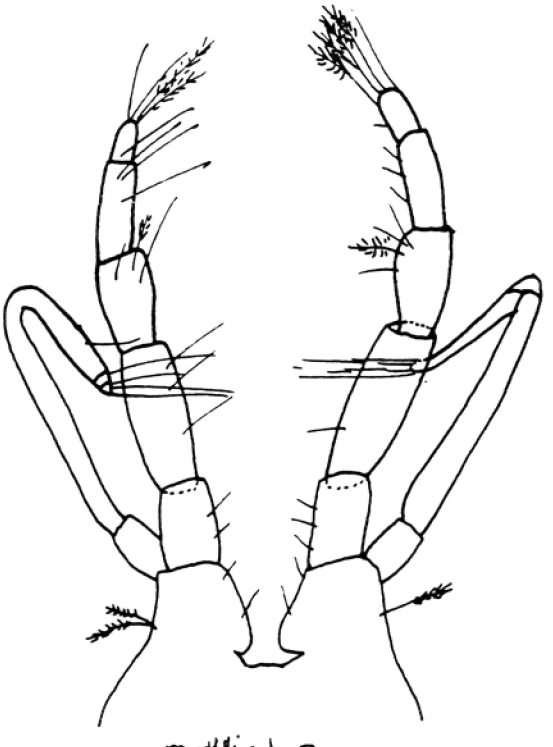
Phimochirus McLaughlin 1981
Phimochirus californiensis (Benedict) 1892
Santa Catalina Island and Monterey, CA, to Panama and Galapagos Isl.
Littoral to 129 m.
Ref: Benedict 1892: description (as *Eupagurus*).
Benedict 1892: description (as *E. mexicanus*).
Schmitt 1921: (as *Pagurus*) description and illustrations (whole body and anterior).
Glassell 1937: (as *Pagurus*) discussion.
Scanland 1964?: (as *Pagurus*) description, key and diagrammatic illustration.
Haig, Hopkins and Scanland 1970: description (as *Pylopagurus*) and key.
Haig 1974?: (as *Pylopagurus*) key.
Wicksten 1977: artificial key.
McLaughlin 1981b: description and plates (chelae).
Orthopagurus Stevens 1927
Orthopagurus minimus (Holmes) 1900
British Columbia to San Diego, CA.
11 to 64 m.
Ref: Holmes 1900: (as *Pagurus*)
Schmitt 1921: (as *Pylopagurus*) description and plate figures.
Stevens 1927: description of species and new genus, keys and plates (whole body).
Makarov 1938: description.
Scanland 1964?: (as *Pylopagurus*) description and key.
Hart 1971: range extension.
Haig 1974?: key.
McLaughlin 1974: description, key and illustrations.
Wicksten 1977: artificial key.
Kozloff 1987: key.

Family Parapaguridae
Parapagurus Smith 1879
Parapagurus haigae de Saint Laurent 1972
Ref: Haig 1974?: key.
Parapagurus pilosimanus benedicti de Saint Laurent 1972
Alaska to Gulf of Panama
750 to 1902 m.
Ref: Haig 1974?: key.
McLaughlin 1974: description, key and illustrations.
Kozloff 1987: key.

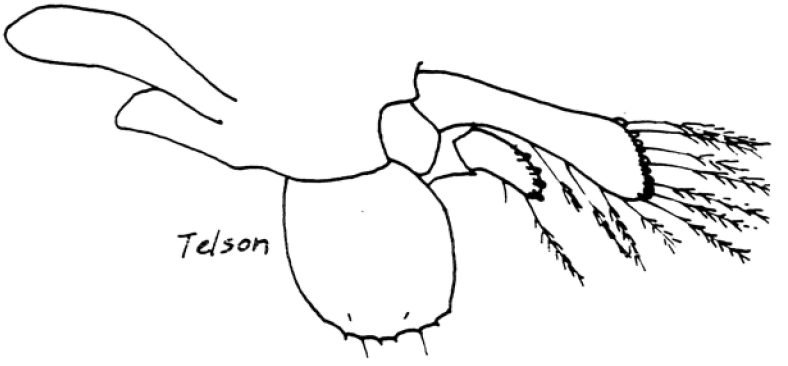
cf. Isocheles pilosus, 1st crab stage

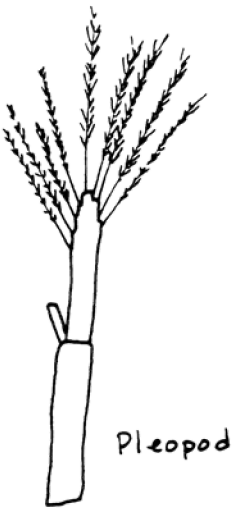


chelae



maxilliped 3





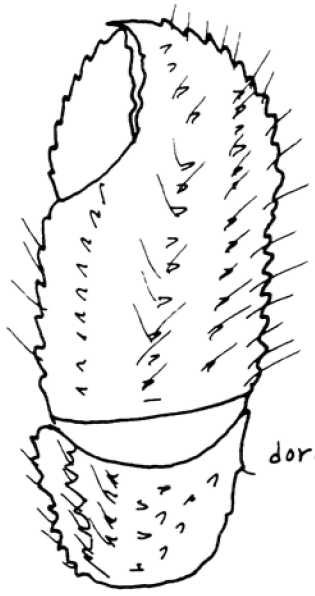
Pleopod

Huntington Beach NPDE
1E I, 1F III, 1D IV
1 Aug 89

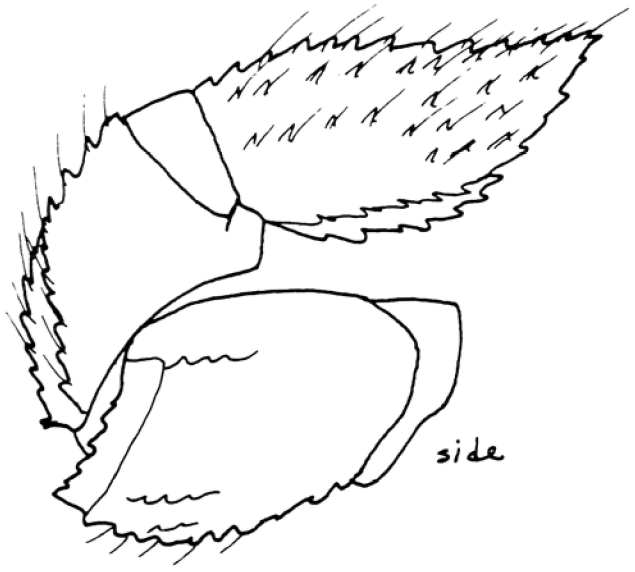
in Olivella baetica
Neverita recluziana
Epitonium, Alvinia
other small mid
mollusk shells

Isocheles pilosus, Adult

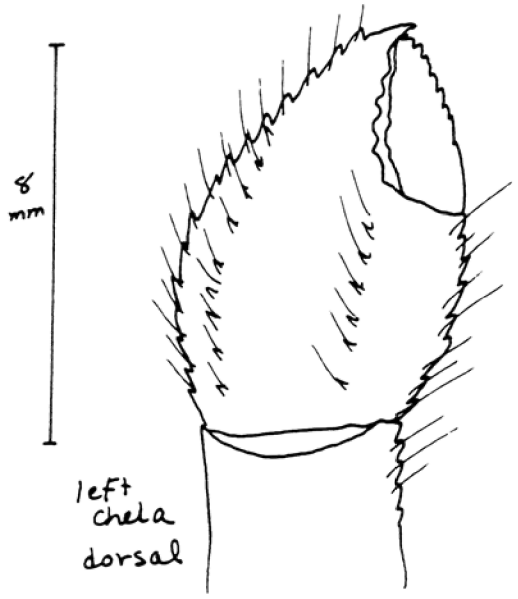
Huntington Beach TE
G 11/71
SL = 8 mm



rt. chela
dorsal

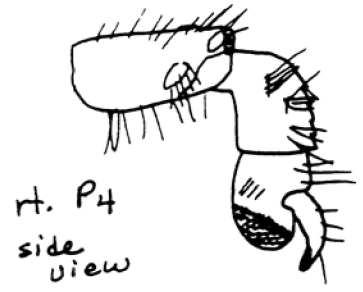


side



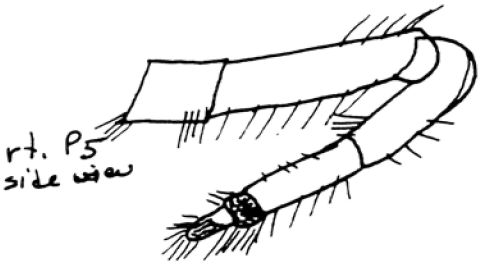
8 mm

left chela
dorsal

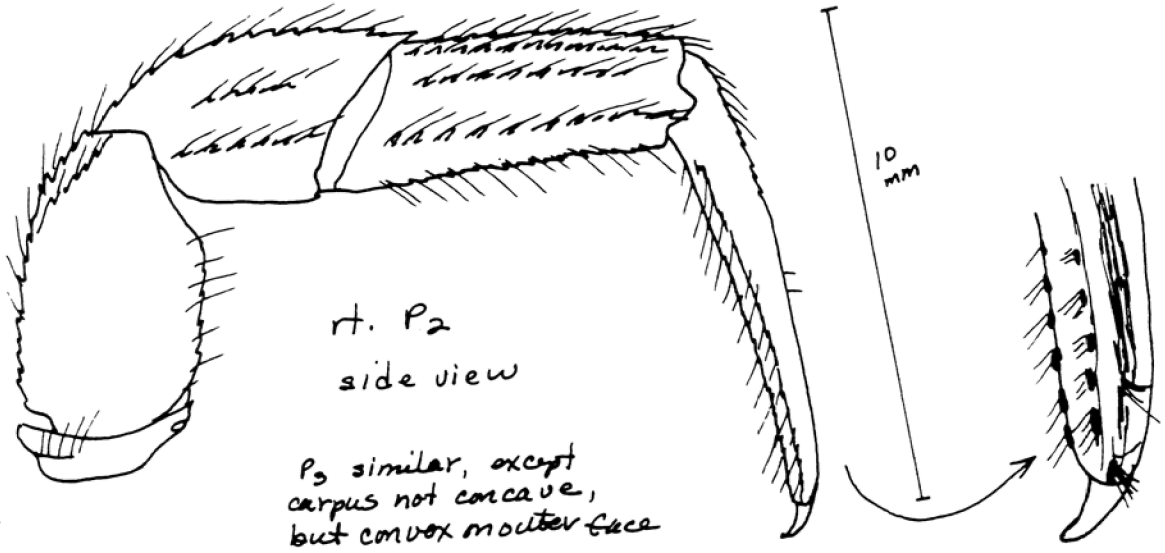


5 mm.

rt. P_4
side view



rt. P_5
side view



10 mm

rt. P_2
side view

P_3 similar, except carpus not concave, but convex mouther face

NATURAL HISTORY MUSEUM
of Los Angeles County

900 Exposition Boulevard
Los Angeles, California 90007

PLEASE POST/CIRCULATE

NATURAL HISTORY MUSEUM RESEARCH SEMINARS

JANUARY - MARCH 1990

11 JANUARY	DOUGLAS J. EERNISSE - University of Michigan PHYLOGENETIC PATTERNS AMONG CHITONS
18 JANUARY	NANCY J. BLOMBERG - LACM/Anthropology SACRED FIGURES IN NAVAJO BLANKETS: A Re-evaluation of Time Frame and its Implications for Cultural Change
1 FEBRUARY	ANDREW R. CAMERON - California Institute of Technology CELL LINEAGE RELATIONSHIPS DURING SEA URCHIN DEVELOPMENT
6 FEBRUARY (TUESDAY)	DAVID JABLONSKI - University of Chicago ON THE ORIGIN OF ORDERS: Ecological Patterns in the Origin of Higher Taxa
8 FEBRUARY	PETER C. WAINWRIGHT - UC-Irvine MORPHOLOGY AND ECOLOGY: Functional Basis of Feeding Constraints in Coral Reef Fishes
15 FEBRUARY	GEORGE L. KENNEDY - LACM/ Invertebrate Paleontology PALEOGEOGRAPHY AND GEOCHRONOLOGY OF PLEISTOCENE MARINE TERRACE FAUNAS, PACIFIC COAST OF NORTH AMERICA
22 FEBRUARY	GEERAT J. VERMEIJ - UC-Davis EXTINCTION AND SURVIVAL IN THE COLD NORTHERN OCEAN: What is so great about the Northwest Pacific?
1 MARCH	ROBERT ORNDUFF - UC-Berkeley THE SEX LIFE OF CYCADS
7 MARCH (WEDNESDAY)	JAMES W. ARCHIE - CSU-Long Beach MEASURING HOMOPLASY LEVELS AND EVALUATING ITS CONSEQUENCES IN PHYLOGENETIC DATA
15 MARCH	THOMAS C. COX - University of Southern California THE GRASSHOPPER PLAGUE IN THE TRANS-MISSISSIPPI WEST, 1874-78: A Laboratory for Reform and Community Organization

ALL SEMINARS ARE AT 3:00 PM
Times Mirror Room - Natural History Museum
--ALL INTERESTED PERSONS ARE INVITED TO ATTEND--

POSITION ANNOUNCEMENT

RESEARCH TECHNICIAN

The Southern California Coastal Water Research Project (SCCWRP) has an opening in the benthic laboratory for an experienced research technician. Applicants must have at least a Bachelor's degree in biology. Experience in crustacean and/or echinoderm taxonomy, shipboard sampling of soft substrate habitats, aquarium culture and experimentation with marine invertebrates, data management, manipulation, analysis, and report writing are all desirable skills.

SCCWRP is a public agency that is nationally recognized for its research in marine environmental science. This is a full time position with excellent benefit package and salary commensurate with background. Please submit resume with the names and address of three references to:

Dr. Bruce Thompson
Southern California Coastal Water Research Project
646 W. Pacific Coast Highway
Long Beach, CA 90806