



**Southern California Association of  
Marine Invertebrate Taxonomists**

3720 Stephen White Drive  
San Pedro, California 90731

September, 1992

Vol. 11, No. 5

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**NEXT MEETING:** Diastylid Cumaceans

**GUEST SPEAKER:** Tony Phillips  
Hyperion Treatment Plant

**DATE:** October 19, 1992 (note **third Monday**)  
9:30am - 3:00pm

**LOCATION:** Cabrillo Marine Museum  
San Pedro, California

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**OCTOBER 19 MEETING:** Remember to bring any interesting diastylid specimens or taxonomic problems to the meeting.

**MINUTES FROM MEETING ON SEPTEMBER 15:**

Ron announced that Dr. Bruce Thompson is leaving Southern California Coastal Water Research Project (SCCWRP) to work in the San Francisco Bay area. Prior to leaving SCCWRP, Bruce Thompson signed a contract with the U.S. EPA to produce a master species list of benthic infauna of the Southern California Shelf. SCAMIT is still investigating the legalities for being the subcontractor in the production of this list.

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SCAMIT newsletter is not deemed to be a valid publication for  
formal taxonomic purposes.

Don Cadien of the Los Angeles County Sanitation District informed us that two new species of Thalassinoid shrimp, Econaxius acutifrons and a species of Calocarides (in preparation), are occurring. Don plans on revising his notes and key. If anyone is interested in this information please contact Don.

The Treasurer, Ann Dalkey, reported that there is \$2,958 in the SCAMIT savings account.

The first speaker, Philip Bairrington, California Department of Fish and Game at Long Beach Ca., presented slides and video on "Vertical Zonation Patterns of Rocky-wall Communities in Carmel Bay, California". He demonstrated that there was vertical zonation related to light, temperature, scouring, competition, colonization, etc. If anyone is interested in inquiring about receiving a copy of the video of the canyon wall please contact Philip Bairrington, California Department of Fish and Game (Long Beach), at (310) 590-5166.

Larry Lovell presented a slide show on the Fourth International Polychaete Conference, Angers France. Posters by Ann Dalkey-Hyperion, Karen Green-consultant, and Larry Lovell-consultant were on display along with literature and handouts from the conference.

Dr. Kirk Fitzhugh, Los Angeles County Museum of Natural History Museum (LACMNH), concluded the morning with a presentation entitled "A Cladistic Analysis of Polychaete Families" which he delivered at the polychaete conference. He presented evidence that the polychaeta is a monophyletic group. The cladistic program he used was Hennig-86. The analysis was based mainly on external morphology but Kirk did not rule out using internal structures. One of the features he used to separate polychaeta from sipuncula, echiura, and oligochaeta was the presence or absence of nuchal organs. The groups sedentaria and errantia are separate (paraphyletic) within the polychaeta. Sedentaria is composed mainly of the terebellid morphology and the group itself is unstable. The errantia group is composed mainly of the eunicid and phyllodocid morphology and is more derived and thus more stable. A copy of his abstract is included in the newsletter.

In the afternoon, Drs Masahiro Dojiri, Hyperion Treatment Plant, and Kirk Fitzhugh presented a workshop on the preparation of taxonomic publications. Mas covered the steps involved starting from specimen collection and preservation to final publication. This proved to be very informative and helpful. Included in the newsletter is a handout that Dr. Dojiri put together for the workshop.

Also included in the newsletter is the Fall 1992 schedule of research seminars at the Natural History Museum of Los Angeles County.

The SCAMIT Christmas party has been scheduled for Saturday, December 5 at Cabrillo Marine Museum.

**FUTURE MEETINGS:**

The November 16-17 meeting (note: third Monday and Tuesday of the month) will be an Amphipod Workshop given by Dr. E. L. Bousfield of the Royal British Columbia Museum, Victoria, British Columbia, Canada. The meeting will be at the Los Angeles County Museum of Natural History, Los Angeles, Ca. Dr. Bousfield will emphasize phyletic classification of amphipods and the rationale for this classification. He will also provide a preview of his forthcoming west coast amphipod guide book, coauthored with Craig Staude. Please bring any problem specimens and any problems you may have encountered with the Barnard Monograph on Gammarid Amphipods to the meeting.

The December 14 meeting will include discussions of Polycirrinae Terebellid Polychaetes by Leslie Harris of the LACMNH, and a talk entitled "Blue Water Plankton" by Dr. Bill Hamner of the University of California, Los Angeles. The meeting will be held at the Allan Hancock Foundation room B-55, University of Southern California, Los Angeles, Ca.

**SCAMIT OFFICERS:**

If you need any other information concerning SCAMIT please feel free to contact any of the officers.

President	Ron Velarde	(619)692-4903
Vice-President	Larry Lovell	(619)945-1608
Secretary	Diane O'Donohue	(619)692-4901
Treasurer	Ann Dalkey	(310)648-5317



CLADISTIC ANALYSIS OF RELATIONSHIPS AMONG THE POLYCHAETE FAMILIES. Fitzhugh J.K.(\*) & Fauchald K. Natural History Museum of Los Angeles County, Los Angeles, CA 90007 and National Museum of Natural History, Smithsonian Institution, Mail Stop 163, Washington D.C. 20560 USA.

Some major taxa, e.g., the aphroditids and eunicids, both sensu lato, have been recognized consistently as natural groupings for 100+ years. The traditional separation of the polychaetes into two groups and all other proposed groupings into suprafamilial taxa have been only moderately successful. Classificatory studies differ from evolutionary studies in that the presence of links between the groups need not be specified. Most systematists believe that their classification, including the order in which the taxa are presented, reflect phylogeny. In most cases the phylogenetic arguments are not explicit. Any phylogeny based on these schemes would uncover paraphyletic groupings. We are here presenting a new phylogenetic analysis of the relationships among the polychaete families.

We have analyzed the characters traditionally used to define taxa at the family-level and defined character states so that members of all families can be scored unequivocally. We have added, mostly anatomical, characters previously rarely considered, or at least considered only one at a time. We scored, if possible, the characters for a specimen of the type species of the type genus for each family (on classificatory rather than cladistic grounds); medium-sized to large specimens were used preferentially. Small specimens and indeed all specimens of small species, tend to have less developed anterior appendages, less complicated parapodia and often fewer kinds of chaetae than larger specimens (or species). We also assumed initially that all families as currently recognized were monophyletic. The cladistic program used was Hennig-86; options will be presented in the talk. Autapomorphic characters defining single terminal taxa were excluded from the analysis: We find it unlikely that for example the joint absence of the ventral shield of the sternaspids carry much weight as a synapomorphic feature for all non-sternaspid polychaetes. Outgroup taxa included echiurans and sipunculans in addition to oligochaetes.

The major taxa listed above were confirmed as being monophyletic. The families of the Phyllodocida can be ranged together; similarly families with dorsal feeding palps (or some modification of these) can be grouped in a single sequence. We are at this point debating the position of other families, especially the orbinids, paraonids, maldanids, capitellids, opheliids and the small families usually listed near these families.

# SCAMIT PUBLICATION WORKSHOP

## (EMPHASIS ON SMALL CRUSTACEA)

Masahiro Dojiri

### I. SPECIMEN COLLECTION AND PRESERVATION

### II. SPECIMEN IDENTIFICATION AND NEW TAXA DETERMINATION

- A. Clear and examine specimens
- B. Determine that all specimens in collection are same species
- C. Assess number of adult females and males
- D. Measure females and males (10 of each)  
(Conversion sheet, magnification scales, and measurement sheet)
- E. Select specimens for dissection
- F. Dissect females and males
- G. Conduct literature research
  - (1) Personal library of reprints
  - (2) Zoological Records
  - (3) Correspondence with recognized experts in field
- H. Specimen identification - verify generic identification
- I. Diagnostic notebook or table - taxonomic character comparison between new taxon and previously described taxa

### III. SELECTION OF TYPE-SPECIMENS AND SPECIMENS FOR DISSECTION

- A. Holotype, allotype, and paratype
- B. Temporary labeling of material; use pencil
- C. Write material examined sheet

### IV. DISSECTION OF SPECIMENS

- A. Wooden slide procedure of Humes and Gooding (1964)
- B. Dissecting equipment, minuten pins, and Arkansas stones
- C. Proper technique and arrangement of appendages

### V. DETAILED EXAMINATION OF DISSECTED SPECIMENS

- A. Search for armature and ornamentation; detailed studies of publications will help in suggesting what elements and ornamentation to search for
- B. Examine dorsal/ventral and anterior/posterior surfaces of appendages
- C. Examine both members of a paired appendage

- D. Examine at least three or more dissected specimens, i.e., 6 first antennae, 6 mandibles, etc.
- E. Examine under oil of immersion
- F. Sketch schematic drawings of complicated appendages, e.g., first antenna

## VI. PENCIL ILLUSTRATIONS

- A. Select appendages for illustrations; whole mount views (dorsal and lateral) are drawn last after all appendages are illustrated
  - (1) Choose clean appendages: no debris attached
  - (2) Choose appendages with no rips in integument: cuticle entire
  - (3) Choose appendages with all elements (setae/spines) and ornamentation (patches of setules/spinules) intact and clearly visible
- B. Orientation of appendage for illustration
  - (1) Choose accepted view of appendage: view drawn in majority of publications (ease in future comparisons)
  - (2) Choose view that has fewer ghosted setae or shows ornamentation best
  - (3) Appendage or whole mount in bad orientation can be arranged into a good orientation by whole coverglass/depression slide, broken cover glass, or petroleum jelly techniques
- C. Selection of optimum magnification at which to make drawings
  - (1) Objective adjustment
  - (2) Drawing tube magnification, adjustment, and focusing
    - (a) Select drawing tube magnification
    - (b) Turn-down light on microscope
    - (c) Turn-on external light source
    - (d) Focus on tip of sharp drawing pencil
- D. Selection and orientation of paper
  - (1) Majority of drawings can be done on letter size paper (8 1/2" X 11")
  - (2) Some drawings require legal size (8 1/2" X 14")
  - (3) Very few drawings will necessitate taping several sheets together: make several "X" marks at joints of papers for future realignment
  - (4) Photocopy enlargement or reduction for initially suboptimum drawing size
    - (a) It is always easier to draw large (high

magnification) for the details, then do a photocopy reduction

- (b) If under highest magnification the resulting drawing is still too small, photocopy enlarge the drawing

E. Adjustment of microscope diaphragm, condenser, light intensity, and external drawing light to get optimum drawing conditions

F. Make pencil drawing

- (1) Tape paper down
- (2) Record magnification of microscope, magnification of drawing tube, female or male specimen, appendage, and view (dorsal/ventral, anterior/posterior)
- (3) Draw with sharp 3H or HB pencil
- (4) Inspect drawing several times while in progress; make sure appendage is not floating in clearing medium
- (5) Verify all armature and ornamentation
- (6) Darken pencil drawings while making irregular lines smoother. Remember: indentations, irregular surfaces, and curves may be characteristic for this genus or species. Verify all cosmetic changes before completion of pencil drawings
- (7) Verification of final pencil drawing with corresponding appendage of other dissected specimens; note any morphologic variations and draw if necessary
- (8) Illustrate magnified views (call-outs) of complex, taxonomically important, or difficult to observe details, e.g., highly ornamented spines.
- (9) Jot down important notes directly on pencil drawings. These act as reminders when writing descriptions.

## VII. Writing the manuscript

A. Write material examined section

- (1) Holotype, allotype, and paratypes; leave blanks for museum catalog numbers
- (2) Locality, depth, host, attachment site of parasite, date of collection, etc.

B. Write taxonomic description (generalized text: not formatted for any specific journal); never ink plates until taxonomic description is written: there are always mistakes in the pencil drawings, e.g., missed setae, spines, etc.

- (1) Use good taxonomic publication in your specific group as a guideline, e.g., Humes, Kabata, Cressey,

- Ho, and Boxshall; examine and study their approach
- (2) Be as detailed as possible in taxonomic descriptions
    - (a) Describe and illustrate every appendage
    - (b) Describe and illustrate every seta, spine, setule, patch of spinules, etc.
    - (c) Readers can ignore what they want, but can't mind-read

C. Write remarks section

- (1) Diagnostic comparison table
- (2) If the genus is very large, comparisons with every species is tedious and time-consuming for the authors to write and the reader to decipher
  - (a) Select species living in regional area for diagnostic comparisons or
  - (b) Select species with shared unusual morphologic features
- (3) Emphasize unique characters: "The new species can be distinguished from all known species of the genus by ..."

D. Selection of new name (see "Code of Zoological Nomenclature")

- (1) Selection of new specific name - does not have to be unique (binomen must be unique)
  - (a) Descriptive name, e.g., spinusus, longicauda, etc. (adjective or noun in apposition); use Brown, R.W. 1956 (reprinted 1978, 1979). Composition of scientific words. Smithsonian Press.
  - (b) Host name, e.g., embiotocae, plotosi, etc. (genitive singular or plural)
  - (c) Name in honor of someone who contributed significantly to the specific field or did considerable amount of work on research, but not enough for coauthorship, e.g., collected specimens, helped in literature search that was important for publication
  - (d) Locality name, e.g., brasiliensis, californianus, etc.
  - (e) Verify that binomen does not already exist
- (2) Selection of new generic name - must be unique
  - (a) Check "Nomenclator Zoologicus" for generic names: a list of existing names of genera and subgenera in zoology from the tenth edition of Linnaeus (1758) to the end of 1935
  - (b) Check "List of new generic names" of

"Zoological Records" starting from 1870 to current issue

- (c) Check also "Index Animalium"
- (d) Warning; example of Scolocercos ("thorned tail" used by Ragge in 1980 for insect) so changed to Scoloura; Kronos was changed before publication to Norkus; and Tandanicola was changed to Arrama.

E. Write etymology

- (1) Origin of name (Latin, Greek, anagram, etc.)
- (2) Gender, noun or adjective
- (3) What name alludes to
- (4) Example: "The specific name spatha, a Latin feminine noun meaning broad sword without a point, alludes to the broad truncate tines of the sternal furca of the female copepod; it stands as a feminine singular noun in apposition to the generic name."

F. Write introduction

- (1) Describe collection of specimen or how you obtained them
- (2) Discuss genus if new species; discuss family if new genus
  - (a) Mention zoogeographic distribution
  - (b) Discuss species within genus or genera within family: number, habitats, natural history, evolutionary relationships; whatever you think is necessary and important
- (3) Discuss new taxon as subject of the paper

G. Write material and methods

- (1) This section is easiest to write
- (2) Include museum address where types are deposited
- (3) Include status of dissected specimens: museum or collection of author (Remember to make permanent mounts of dissected specimens after paper is published or in press)

H. Write abstract

- (1) Keep it short
- (2) Include only pertinent information
  - (a) Locality, habitat, depth of collection, etc.
  - (b) Diagnostic features of new taxon
  - (c) Possible evolutionary of morphologic affinities

I. Compile literature cited

- (1) Verify that all citations in text are in literature cited section
- (2) Verify that all literature cited references are all actually cited in text
- (3) Authorities and dates as part of taxonomic names are not normally cited by journals if not used also in the text

#### VIII. Choose journal

- A. Journal specializing in your specific group, e.g., Journal of Crustacean Biology, Systematic Parasitology
- B. Journal specializing in taxonomy, e.g., Proceedings of the Biological Society of Washington, Journal of Natural History, etc.
- C. Journal published in a region (locality) where specimens were collected, e.g., Canadian Journal of Zoology, Australian Journal of Zoology, etc.
- D. Examine reproduction of illustrations, quality of paper, and format of journal

#### IX. Ink figure plates

- A. Choose plate size
  - (1) Measure full text page of journal article
  - (2) Allow space of about 1/2" - 3/4" for figure legend
  - (3) Blow-up to about 2 1/2 times resultant measurements
- B. Cut plates
- C. Tentative arrangement of pencil illustrations on plate
  - (1) Try to keep female and male separate
  - (2) Put large figures on plate first, then fill with smaller figures
  - (3) Attempt to arrange from top left and end at bottom right
  - (4) Plate should be balanced and aesthetically pleasing
  - (5) Most important is to use the fewest plates possible
  - (6) Half plates are OK, just draw a blue pencil line to demarcate end of plate
  - (7) Play with plates until optimum arrangement is completed
- D. Ink first plate
  - (1) Take all pencil drawings and arrange on first plate
  - (2) Tape down the one you want to ink; remove all other drawings; ink the figure
  - (3) Repeat until all drawings of first plate are completed
  - (4) Repeat for all plates

**E. Reduce all figure plates**

- (1) PMT's
- (2) Two-step photocopy reduction: reduce top of plate, then bottom of plate, tape together, and then reduce to final 8 1/2' x 11" for MS to be submitted. Type in figure number, scientific binomen, and sex of specimen at bottom of each reduced figure plate.

**F. Label all figures**

- (1) Include scale bars near figures (must be unambiguous)
- (2) Label figures with numbers or letters next to figures (must be unambiguous)
- (3) Use scale bars and labels to fill large space gaps between figures. This balances the figure plate and makes it more aesthetic

**X. Finish writing manuscript**

**A. Write figure legends**

- (1) Include scientific binomen, new species, and sex
- (2) List appendages
- (3) Explanation of symbols or abbreviations used in labels
- (4) Measurement scales used in illustrations

**B. Write acknowledgments**

- (1) Have running list for acknowledgments
- (2) Mention names, institutional affiliations, and aid provided
- (3) Acknowledgment of grants or special funding

**XI. Deposition of type-specimens to museum**

- A. Properly label holotype, allotype, paratypes
- B. Include locality, depth, collector, date, name, author, etc.
- C. Use label paper and permanent ink
- D. Vial within a vial method for storage using cotton plugs
- E. Properly pack for shipping
- F. Include cover letter to museum curator

**XII. Format entire manuscript for specific journal**

- A. Photocopy "Notes to Contributors" section on back cover of appropriate issue
- B. Read carefully; hi-lite important points
- C. Is a title page required?
- D. Address of author(s) on title page or end of MS
- E. Follow format of published papers in the journal

- F. Pay particular attention to literature citation section. Are journal names spelled out in full? Also, follow punctuation in citations precisely
- G. Include museum catalog numbers for holotype, allotype, and paratypes in material examined section

### **XIII. External review**

- A. Often times, when I need some peer-feedback before official submission to a journal, I will send the final manuscript to several colleagues. Remember to send them a draft you consider to be final; they should not have to rewrite major portions of the MS for you.
- B. Review all comments and make necessary corrections. Remember: you have the final decision; after all it is your paper.

### **XIV. Review entire manuscript**

- A. Check figures, figure labels, scale bars, symbols
- B. Check entire figure legend and cross compare with figure plate
- C. Check text citation of figures
- D. Carefully check text for typos, punctuation, spelling, etc.
- E. Check numbers of specimens add up to total reported
- F. Remember to number all your pages, except the first page which is usually counted, but not numbered.

### **XV. Submission to journal**

- A. Write cover letter to editor and include the following:
  - (1) Title of manuscript
  - (2) Complete authorship (names of coauthors)
  - (3) Ability or inability to pay for page charges. There are several international journals that do not have page charges and a few domestic journals that will waive them (see "Notes to Contributors")
  - (4) Send appropriate number of photocopies (see "Notes to Contributors"). Remember to keep one for yourself.
- B. Many authors keep the original figure plates until the manuscript has been officially accepted for publication ("In Press"). This has several advantages:
  - (1) The author can make corrections on it if reviewers request changes.
  - (2) If paper isn't accepted for publication, cost of mailing isn't wasted.
  - (3) Author safely keeps plates until editor actually needs them, thus reducing chances of the editor losing the plates
  - (4) Remember - Whatever you do inform the editor in the

cover letter.

**XVI. Study reviewer's comments**

- A. Most journals have 3 outside peer-reviewers
- B. Reviewers fill-out a form with general comments and write directly on MS with detailed comments.
- C. Make only those changes that you think improve the MS.
- D. Address all comments and suggestions.
- E. Send back revised MS with cover letter explaining to the editor which changes were not made to the MS and your reasons. Remember that there is an editorial prerogative.

**XVII. Carefully examine proofs**

- A. Write in museum catalog numbers if you haven't already done so.
- B. Read each syllable of each word in text. Some authors examine proofs backwards from right to left, end to beginning. Do not make any extensive changes in proofs; it is much too costly. Take time to carefully examine proofs.
- C. Check all figures, figure numbers, figure legends.
- D. Cross compare MS to proofs.
- E. Use appropriate (accepted) editorial correction marks on proofs. Journals often send a sheet with editorial marks that should be used. CBE Style Manual can be used.
- F. Send back proofs to editor with cover letter as soon as possible (within a few days, not weeks). You could be holding up the entire issue if you delay.

**XVIII. Prepare permanent slides of dissected specimens**

**XIX. Reprints**

- A. Reprints are usually sent to the authors 1-3 months after paper comes out in print in journal.
- B. Some journals provide 50-100 free reprints; most charge authors. See "Notes to Contributors".
- C. Send reprints to appropriate people and certainly to anyone in the acknowledgments.

RESEARCH SEMINARS

NATURAL HISTORY MUSEUM OF LOS ANGELES COUNTY

Fall 1992 Schedule

- 17 September Sarah George - NHMLAC.  
Systematics of red-toothed shrews: Are different genera evolving at varying rates?
- 24 September Julian Donahue - NHMLAC  
The search for little gray moths in California.
- 1 October John Heyning -NHMLAC  
Systematics and ecology of common dolphins: Evidence for two species.
- 8 October Scott France - Scripps Institute of Oceanography  
Gene flow among isolated populations of deep-sea scavenging amphipods.
- 14 October\* R. G. Wear - Victoria University of Wellington.  
Determination of biomass in unfished subtidal surf clam populations along exposed sandy coastlines of New Zealand.
- 22 October Charles Marshall - UCLA  
Integrating paleontological, morphological, and molecular data in understanding evolutionary relationships.
- 29 October David Rickman and Louise Coffey-Webb - NHMLAC  
One hundred years of Hispanic Californian costume.
- 5 November Robert Lavenberg - NHMLAC  
Is megamouth (Megachasma pelagios) an alien from the depths?
- 12 November John Stephens - Occidental College  
The importance of long-term studies in interpreting environmental effects upon marine fishes.
- 19 November Annalisa Berta - San Diego State University  
Beyond the cladogram: The evolution of pinniped locomotory and feeding patterns.
- 3 December Margaret McFall-Ngai - U.S.C.  
Calamari enlightened: Bacterial bioluminescence in sepioid squids.

Seminars begin at 3:00 P.M. in the Times-Mirror Room

\* Wednesday seminar