Southern California Association of
Marine Invertebrate Taxonomists

3720 Stephen White Drive
San Pedro, California 90731

July 1989 Vol. 8, No. 4

NEXT MEETING:	August SCAMIT meeting has been cancelled. Next meeting is the Pycnogonid Workshop.
GUEST SPEAKERS:	Don Cadien, Los Angeles County Sanitation Districts and Tony Phillips and Mas Dojiri, Hyperion Treatment Plant
DATE:	Monday, September 11, 1989, 9:30 AM
LOCATION:	Los Angeles County Museum of Natural History 900 Exposition Blvd. Los Angeles, CA

MINUTES FROM MEETING ON JULY 10, 1989

Pinnixa Workshop: Dr. Debbie Zmarzly hosted a Pinnixa workshop at the San Diego Natural History Museum on 10 July 1989. Five work stations were set up with dissecting microscopes with one to several species of southern California Pinnixa at each station. Each participant identified the specimens to species using a key written by Debbie. This format was both informative for the participants and helpful in revising the key. The five stations consisted of the following species:

1) Pinnixa tomentosa, P. littoralis, and P. faba. The latter two species were indistinguishable. Either the specimens of P. faba on demonstration were incorrectly identified, or this species is synonymous with P. littoralis. Debbie promised to examine the type-specimens of P. faba, perhaps housed in the collections of the Academy of Sciences in Philadelphia, in order to resolve the problem. Pinnixa tomentosa exhibit a subtle anterolateral ridge bearing small granulations on the carapace.

2) Pinnixa occidentalis is easily identified by the obliquely, downward angled, fixed finger of the chela.

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3) Pinnixa hiatus, P. longipes, and P. franciscana were easily identified by using the key.

4) Pinnixa weymouthi and P. tubicola were also easily identified using the key.

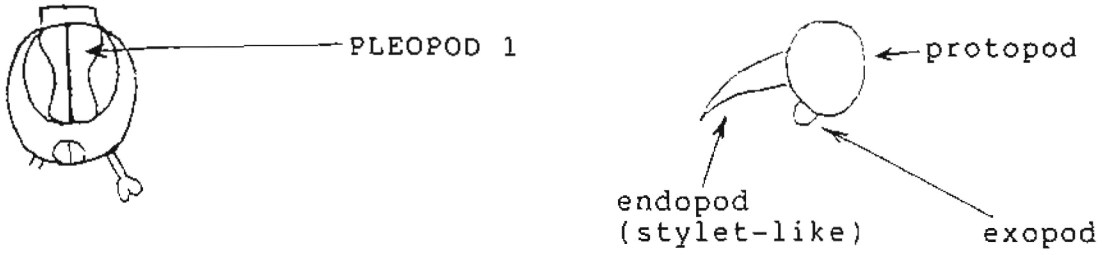
5) Pinnixa schmitti and P. barnhardti. The latter species has a subtle anterolateral ridge with granules on the carapace.

In the original descriptions, most species of Pinnixa were not well illustrated nor well described. Photographs in older papers did not show the morphological details necessary for taxonomic purposes. Debbie's new key, modified from Don Cadien's (see SCAMIT newsletter Volume 3, Number 3), worked extremely well for the southern California species; however, the P. littoralis/P. faba problem needs to be resolved. Also more knowledge must be gained concerning the geographic variations within the species and morphological variations between adults and juveniles. Although there are probably not many new species of Pinnixa in southern California yet to be discovered, Pinnixa sp. A, collected in 100 ft off Goleta may indeed be new to science. It is morphologically very similar to P. weymouthi except that the new species has very long, slender serrated fingers on the cheliped.

Asellota (Crustacea: Isopoda) Seminar: After the Pinnixa workshop, Dr. George Wilson, Scripps Institute of Oceanography, gave a short presentation on asellote isopods in which he reviewed the classification of the Asellota in the "Working List of California Marine Isopods" written by R.C. Brusca and R. Wetzer. Dr. Brusca incorporated the comments in a new revised draft of the "List" (see attached handout). Dr. Wilson then presented a general account of asellotes and gave more detailed information on the superfamily Janiroidea and the families Stenetriidae and Gnathostenetroididae.

Asellotes can be recognized and distinguished from all other isopods by the presence of 2 short, free pleonites with the remaining pleonites fused to the telson to form the pleotelson. The members of this suborder do not use the pleopods for swimming, although the posterior pereopods can be used for this function. The two important functions of the pleopods in the asellotes are respiration and sex; the pleopods are also taxonomically important in this group.

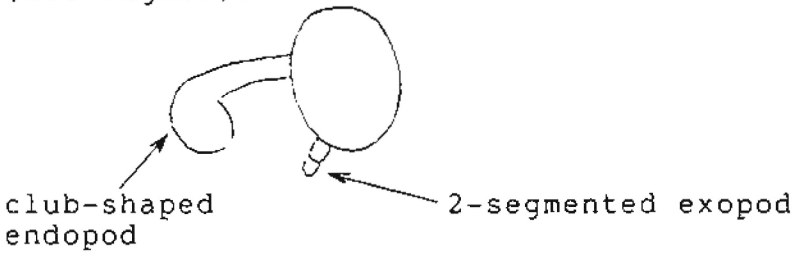
Superfamily Janiroidea: the males of this superfamily have both pleopods 1 and 2 modified into opercula (see figure).



PLEOPOD 2

Family Stenetriidae: this family is known from the Antarctic and Subantarctic waters. Pleopod 3 is opercular. They may occur off our coast.

Family Gnathostenetroididae: the first pleopods are semi-opercular; pleopod 2 is small and pleopod 3 is opercular. In the males, the endopod is club-shaped and the exopod is 2-segmented (see figure).



In shallow water, asellotes are found in cryptic habitats, e.g. under rocks, underneath holdfasts of algae, etc. They are relatively small; consequently, they require small sieve screens for collection. Although they are very diverse in the deep-sea soft-bottom community, not much is known about the asellotes in the deep-sea hard-bottom fauna, except the hydrothermal vent areas.

If an isopod workshop would be helpful to SCAMIT members and if his schedule allows, Dr. Wilson agreed to host a workshop sometime in the future.

7th Annual SCAMIT Picnic: All SCAMIT members are invited to attend the picnic to be held at picnic area #2 at Doheny State Beach on Saturday, 19 August, starting at 10:00 AM until whenever. SCAMIT will provide the entree and soft drinks while members are asked to bring either hors d'oeuvres or a side dish. Beer is allowed on the premises, but will not be provided; BYOB! No glass containers are allowed. Parking is available at $4.00 per day. A map to the picnic area is attached. Larry needs to know how many people will be there so he knows how much food and drinks to buy. RSVP as soon as possible directly to:

Larry Lovell
1036 Buena Vista Drive
Vista, CA 92083
(619) 945-1608

Keys to Marine Isopoda of California: Dr. Richard C. Brusca, San Diego Natural History Museum, announced that Regina Wetzer and he have just completed a draft of a handbook on marine isopods of California. He also distributed five handouts (attached to this newsletter) including 1) a key to the species of Cirolana known from California, 2) a provisional key to the species of Gnathia known from California, 3) a provisional key to California species of Limnoria, 4) a working list of California marine isopods, and 5) a classification of the suborder Flabellifera. The isopod keys are attached to this newsletter; the fourth handout can be obtained from Mas Dojiri upon request. Rick asked that the classification of the Flabellifera not be distributed because it still needs to be revised. He also writes, "This [number 4 above) is a preliminary working list of the marine isopods reported from, or expected to occur in California waters. It is based on a manuscript in preparation by Rick Brusca and Regina Wetzer (A Guide to the Marine Isopod Crustaceans of California). The list almost certainly has errors in it, and it is probably still incomplete; hence, Rick and Regina would greatly appreciate feedback from the SCAMIT community in order to continue correcting and revising it. In addition, Rick would greatly appreciate the donation of California isopod specimens for the synoptic collection being assembled at the San Diego Natural History Museum; even 'common species' would be appreciated." All specimens should be mailed to:

Dr. Richard C. Brusca
Deputy Director for Science
San Diego Natural History Museum
P.O. Box 1390
San Diego, CA 92112

Barnard/1989 Amphipod Workshop Notes: The notes from Dr. J.L. Barnard's 1989 amphipod workshop held on 5 June at the Cabrillo Marine Museum, and 6 and 7 June at the Los Angeles County Museum of Natural History are now available. Write or call Mas for a copy (see previous newsletter for address and telephone number).

Identification of Cancer (Crustacea: Decapoda) in Gut Analyses: Don Cadien suggested that a paper published by Menzies may be helpful for those of us who are conducting fish gut analyses and trying to identify dismembered parts of various species of Cancer. The paper is cited below:

Menzies, R.J. 1951. Pleistocene Brachyura from the Los Angeles area: Cancridae. Journal of Paleontology, 25(2).

Job Opportunity in Los Angeles County: L.A. County Sanitation Districts have an opening for a Marine Biology Laboratory Technician. Responsibilities include infaunal sample sorting, data entry, and sampling at sea. Salary range $2048-$2762/month, starting salary dependent upon qualifications. Contact Dave Montagne at (213) 830-2400, ext. 396 as soon as possible.

Job Opportunity in San Diego: There is an immediate opening for a half-time Curatorial Assistant in the Department of Marine Invertebrates at the San Diego Natural History Museum. Refer to job announcement attached to this newsletter for details.

KEY TO THE SPECIES IN THE GENUS PINNIXA COLLECTED IN SOUTHERN CALIFORNIA MONITORING PROGRAMS

by D.L. Zmarzly
July 21, 1989

(Applies to either sex; sex specific comments so indicated; juvenile males of some species may resemble adult females more than males in certain features)

ATTACHED DIAGRAMS ILLUSTRATE LOCATION OF ANATOMICAL FEATURES AS WELL AS DICHOTOMOUS CHARACTER STATES

1A Inner margin of dactyls of WL1,2, and 3 traces a strongly curved line; adult specimens endo-symbionts of bivalves 2
(FIG. 1A)

B Inner margin of dactyls of WL1,2, and 3 traces a straight or slightly curved line 3
(FIG. 1B)

2A Carapace 2X as wide as long, slightly angular at lateral aspect; orbit wraps around eye, almost enclosing it; MALE: fixed finger of chela slightly deflexed, relatively short, with a single notch near tip . . . . . littoralis
(FIG. 2A & 11)

B Carapace 1.5X as wide as long, with rounded protuberance at antero-lateral aspect; outer margin of orbit grades smoothly into anterior margin of carapace; MALE: fixed finger of chela horizontal, with numerous small teeth . . . . . faba
(FIG. 2B & 12)

3A Fixed finger of chela angled obliquely downward relative to line defined by bottom of propodus (deflection stronger in males than females) . . . . . occidentalis
(FIG. 3A & 13)

B Bottom of propodus of chela sinuous or straight; fixed finger of chela approximately straight or curved upwards at the tip 4
(FIG. 3B)

4A Dactyl of WL4 shorter than or just reaches to distal end of merus of WL3 when both legs are extended 5
(FIG. 4A)

B Dactyl of WL4 definitely exceeds end of merus of WL3 when both are extended 6
(FIG. 4B)

5A Posterior margin of ischium of WL4 without tubercles (best viewed by standing animal on its nose and looking directly down on posterior aspect of leg); WL4 without setae; propodus of WL3 approximately as long as wide (using maximum dimensions), and appears inflated relative to flanking segments . . . . . tubicola
(FIG. 5A & 14)

B Posterior margin of ischium of WL4 with two large tubercles; WL4 completely surrounded by long setal fringe; propodus of WL3 distinctly longer than wide, more in proportion to segments flanking it . . . . . longipes
(FIG. 5B & 15)

6A Antero-lateral aspect of carapace with line of granules, sharp serrations, or blunt serrations, sometimes on a distinct ridge (NOTE: in P. tomentosa and P. barnharti, granules are very fine) 7
(FIG. 6A)

B Antero-lateral aspect of carapace smooth and round; no antero-lateral ridge . . . . . weymouthi
(FIG. 6B & 16)

7A Anterior edge of merus of WL3 serrate or granulate, either lacking setae or sparsely setose 8
(FIG. 7A)

B Anterior edge of merus WL3 smooth, with long dense fringe of plumose setae . . . . . barnharti
(FIG. 7B & 17)

8A Dactyl of WL3 shorter than propodus . . . . . tomentosa
(FIG. 8A 18)

B Dactyl of WL3 approximately equal to or longer than propodus 9
(FIG. 8B)

9A Propodus of WL3 nearly square (i.e., nearly as wide as long); four tubercles on posterior edge of ischium of WL4 (medial one largest, outer 3 smaller); (based on female specimen; male specimen unavailable) . . . . . hiatus
(FIG. 9A & 19)

B Propodus of WL3 definitely longer (1.5 - 2X) than wide; posterior edge of ischium of WL4 smooth or may be granulate, but does not actually bear tubercles 10
(FIG. 9B)

10A Carapace pitted; MALE: with strong transverse ridge in cardiac region . . . . . franciscana
(FIG. 10A & 20)

B Carapace smooth; cardiac region may be slightly inflated, but no transverse ridge in either sex . . . . . schmitti
(FIG. 10B & 21)

SELECTED PINNIXA REFERENCES

Carlton, J.T. and A.M. Kuris. 1975. Keys to decapod Crustacea. Pp. 385-412 IN: Light's Manual: Intertidal Invertebrates of the Central California Coast, 3rd ed. R.I. Smith and J.T. Carlton (eds.) University of California Press, Berkeley. (key)

Hart, J.F.L. 1982. Crabs and their Relatives of British Columbia. British Columbia Provincial Museum Handbook No. 40. British Columbia Provincial Museum, Victoria; 267pp. (key and descriptions)

Holmes, S.J. 1894. Notes on West American Crustacea. Proc. Calif. Acad. Sci., 2nd series, vol. 4: 563-588. (descriptions)

Morris, R.H., D.P. Abbott, and E.C. Haderlie. 1980. Intertidal Invertebrates of California. Stanford University Press, Stanford, California; 690pp. (descriptions)

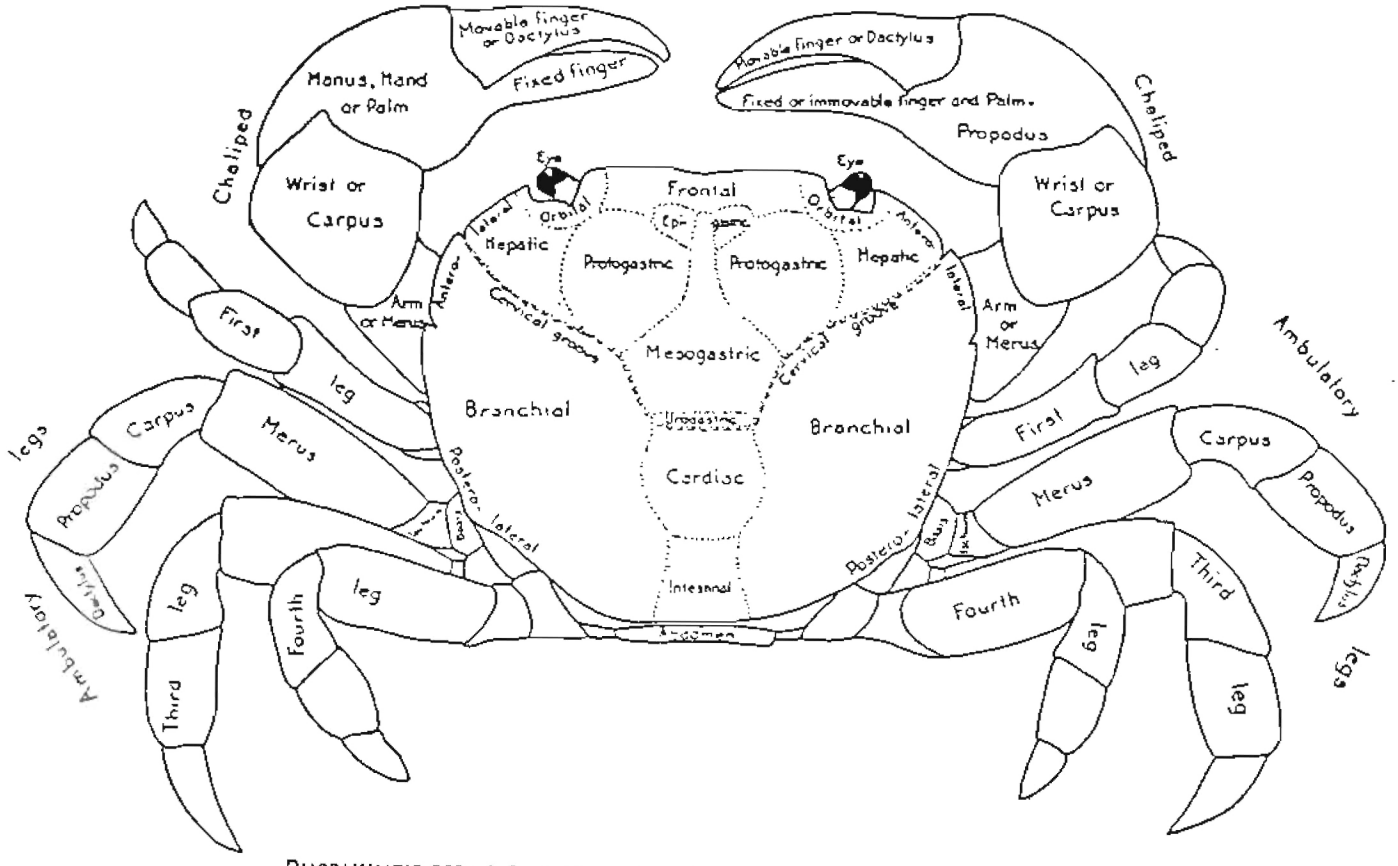
Rathbun, M.J. 1900. Synopses of North-American invertebrates XI. The catometopous or grapsoid crabs of North America. Amer. Nat. 34: 583-592. (keys)

Rathbun, M.J. 1918. The grapsoid crabs of America. Bull. U.S. Natl. Mus. 97: 1-461. (key and descriptions)

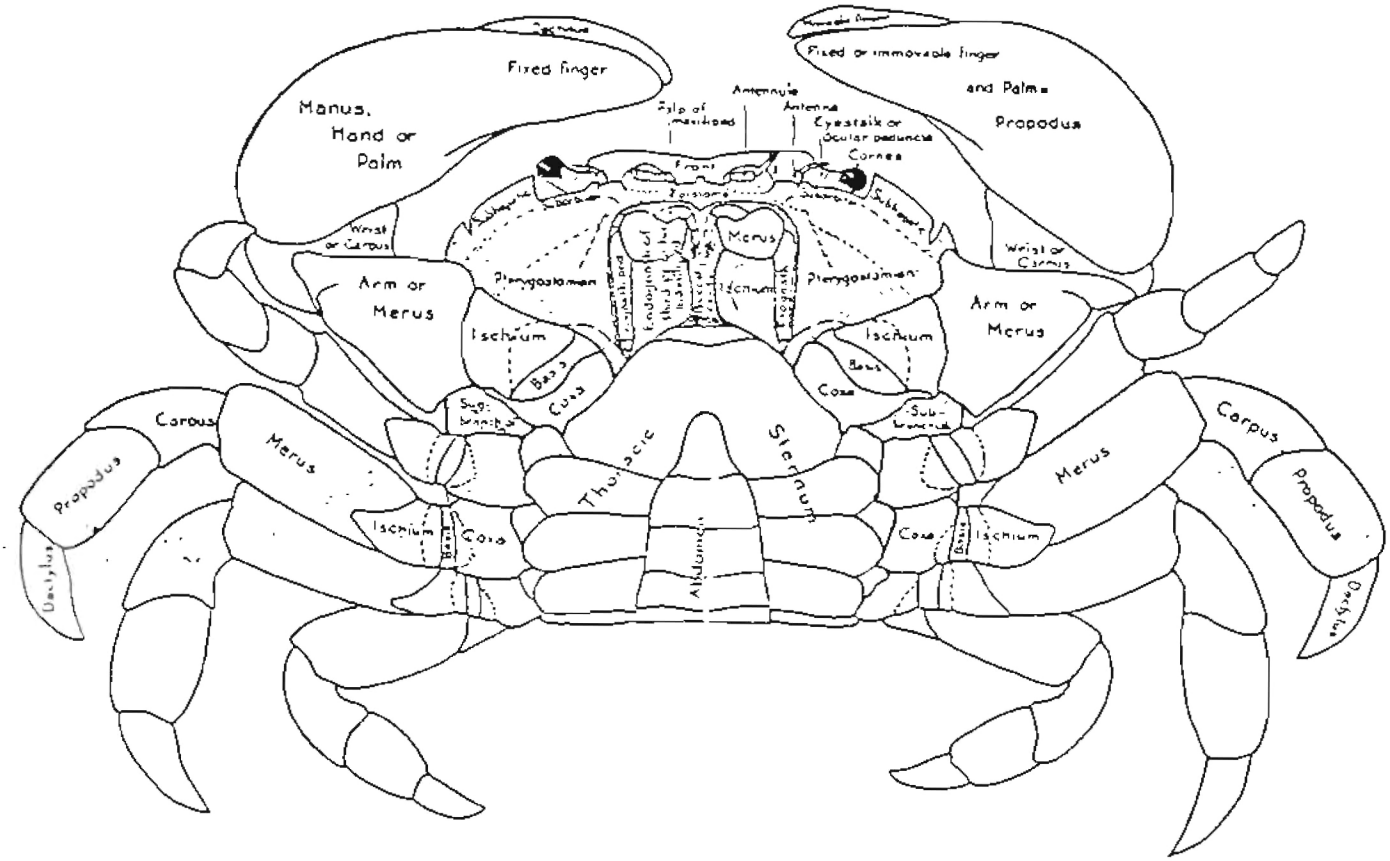
Scanland, T.B. and T.S. Hopkins. 1978. A supplementary description of Pinnixa tomentosa and comparison with the geographically adjacent Pinnixa tubicola (Brachyura, Pinnotheridae). Proc. Biol. Soc. Wash. 91: 636-641. (descriptions)

Schmitt, W.L. 1921. The marine decapod Crustacea of California. Univ. of Calif. Publ. Zool. 23: 1-470. (key and descriptions)

Wells, W.W. 1928. Pinnotheridae of Puget Sound. Publ. Puget Sound Biol. Sta., Seattle 6: 283-314. (key and descriptions)

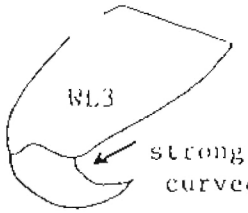


DIAGRAMMATIC DORSAL VIEW OF A GRAPSOID CRAB, SHOWING THE TERMS USED IN DESCRIPTION.

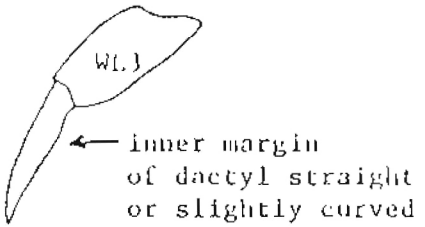


DIAGRAMMATIC VENTRAL VIEW OF A GRAPSOID CRAB, SHOWING THE TERMS USED IN DESCRIPTION.

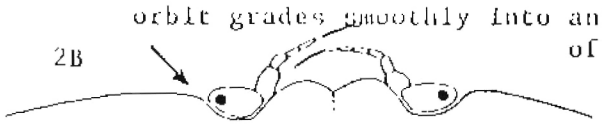
PINNIXA KEY - COUPLET ILLUSTRATIONS



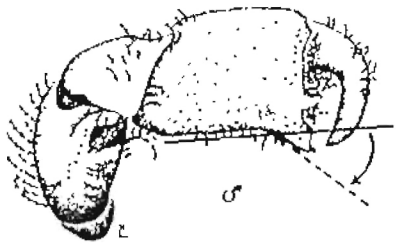
1A

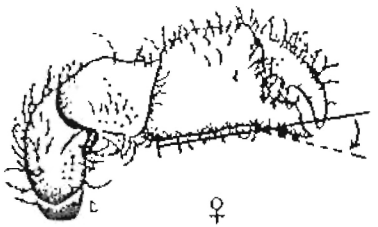


1B

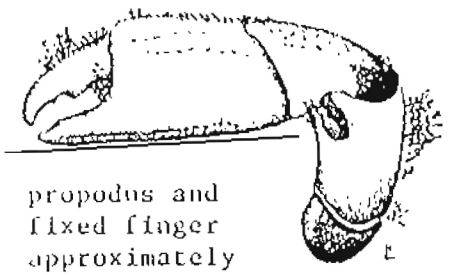


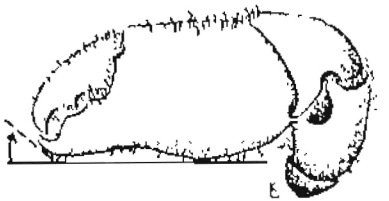
3A: fixed finger deflected downward relative to line of propodus

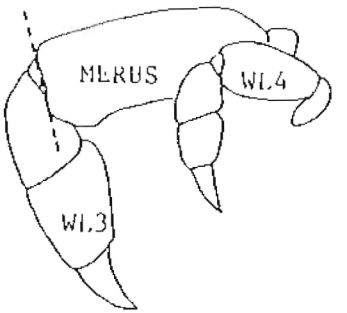




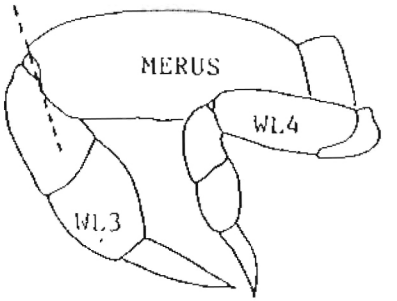
3B



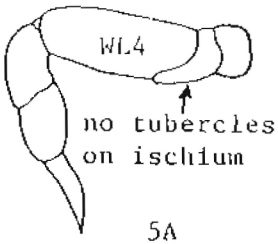




4A



4B



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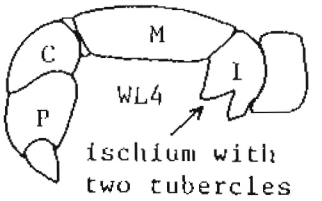
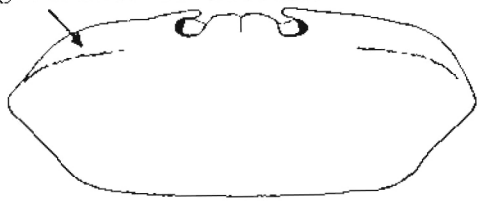


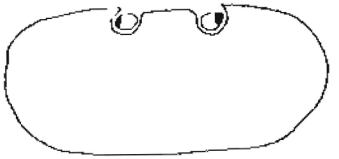
5B

antero-lateral aspect granulate or serrate



6A

no antero-lateral ridge



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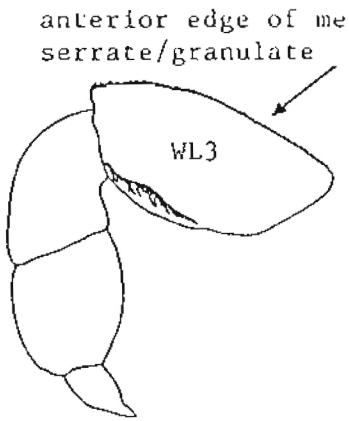

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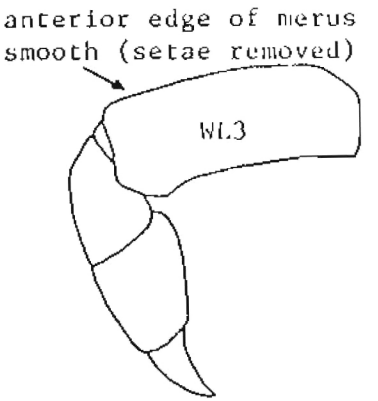

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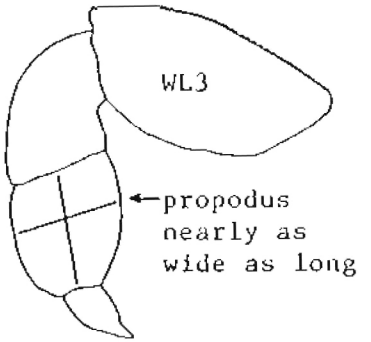

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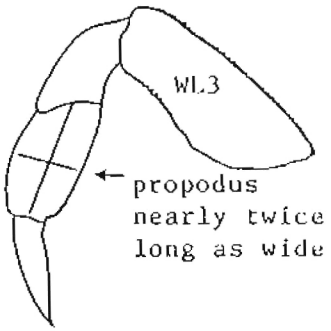

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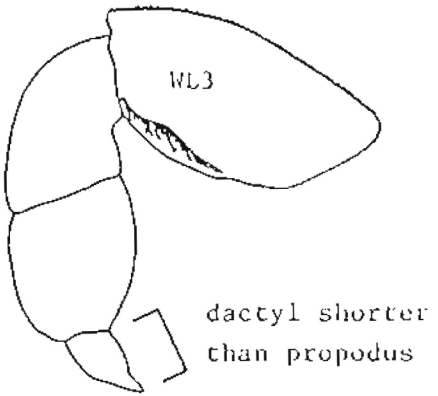

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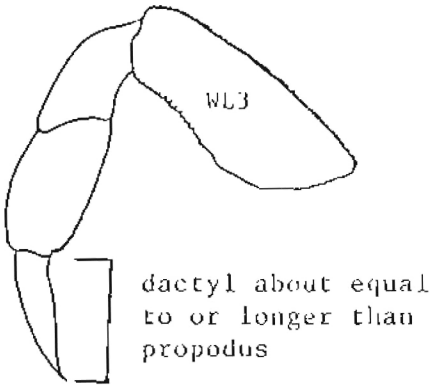
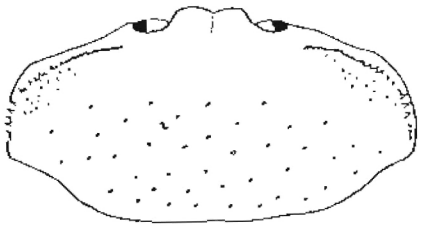


10A



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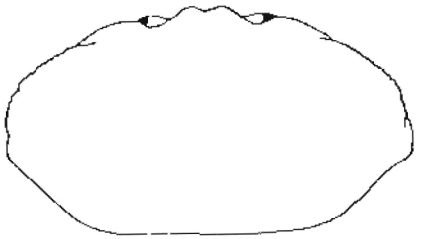


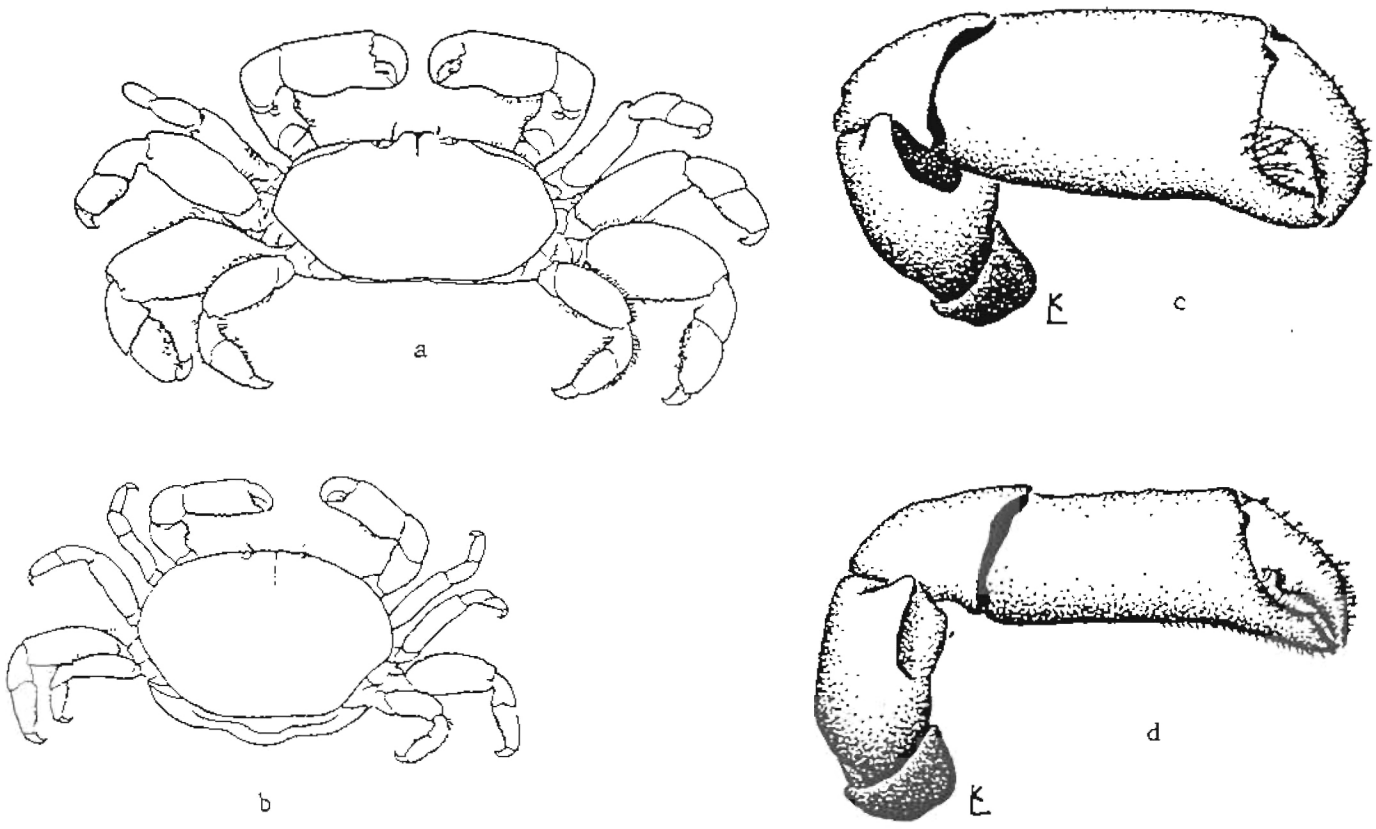


FIG. 11. Pinnixa littoralis: a, Male, dorsal view; b, Female, dorsal view (from Hart, 1982); c, Male, right cheliped, ventral view; d, Female, right cheliped, ventral view (drawings by K. Langan).

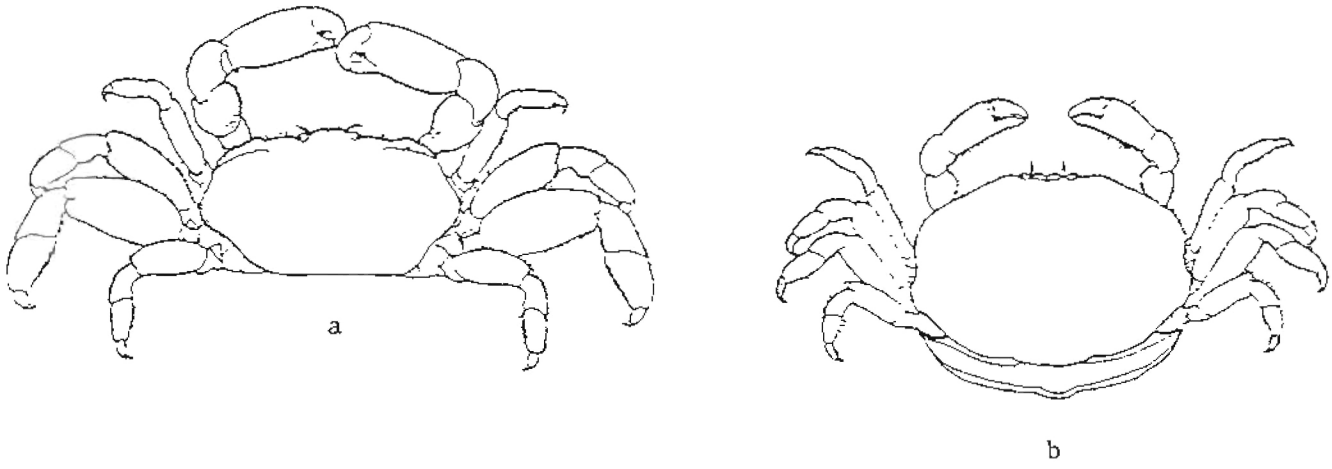


FIG. 12. Pinnixa faba: a, Male, dorsal view; b, Female, dorsal view (from Hart, 1982).

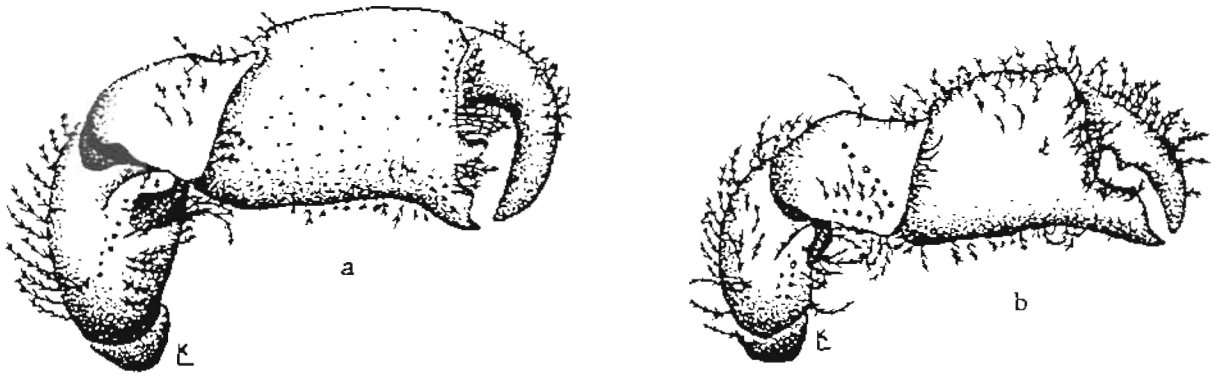


FIG. 13. Pinnixa occidentalis: a, Male, right cheliped, ventral view; b, Female, right cheliped, ventral view (drawings by K. Langan).

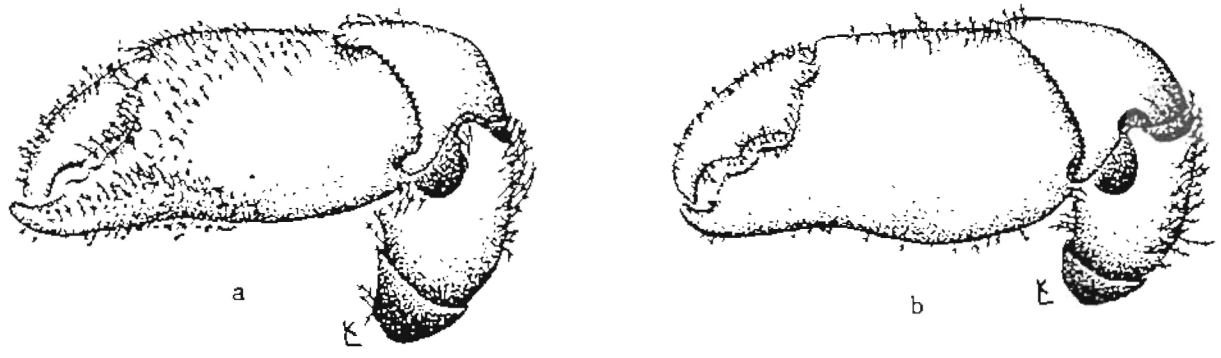


FIG. 14. Pinnixa tubicola: a, Male, left cheliped, ventral view; b, Female, left cheliped, ventral view (drawings by K. Langan).

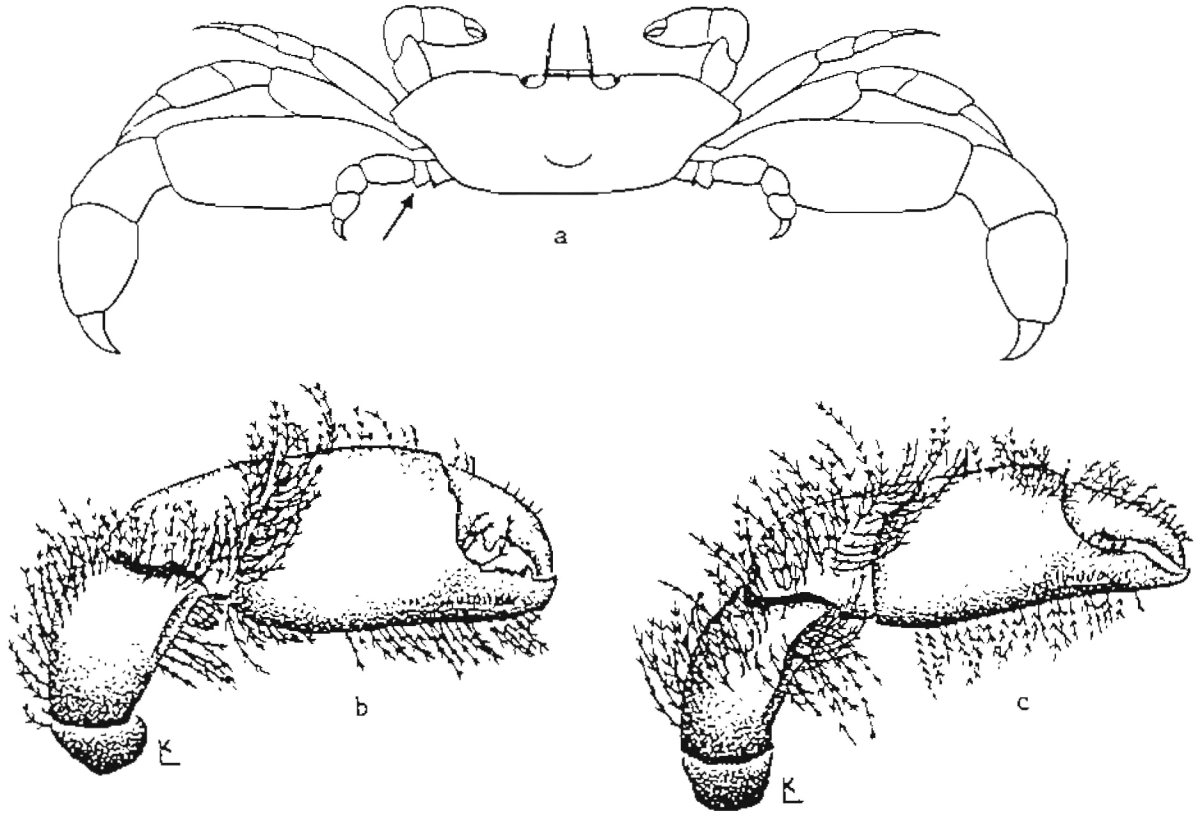


FIG. 15. Pinnixa longipes: a, General body outline (from Holmes, 1894); b, Male, right cheliped, ventral view; b, Female, right cheliped, ventral view (drawings by K. Langan).

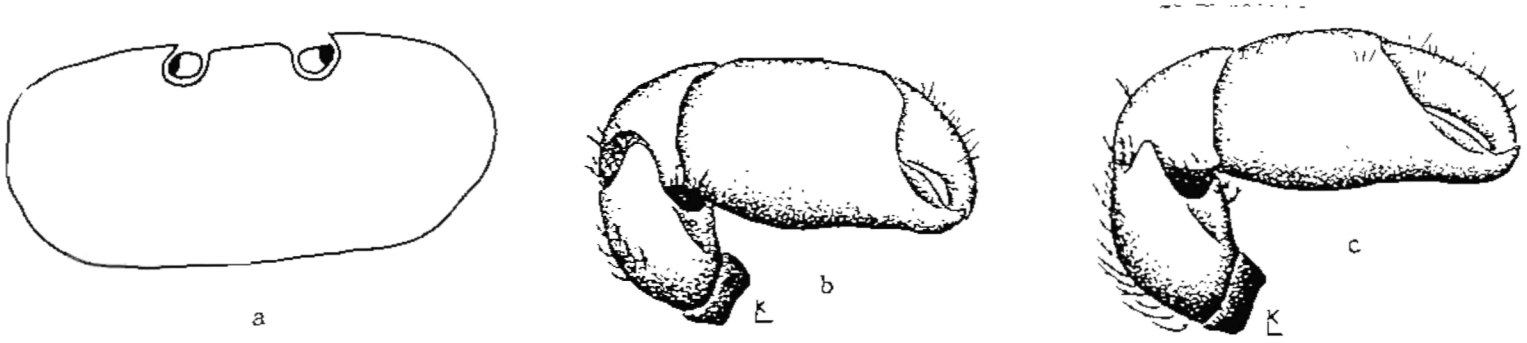


FIG. 16. Pinnixa weymouthi: a, Dorsal view of carapace; b, Male, right cheliped, ventral view; c, Female, right cheliped, ventral view (drawings by K. Langan).

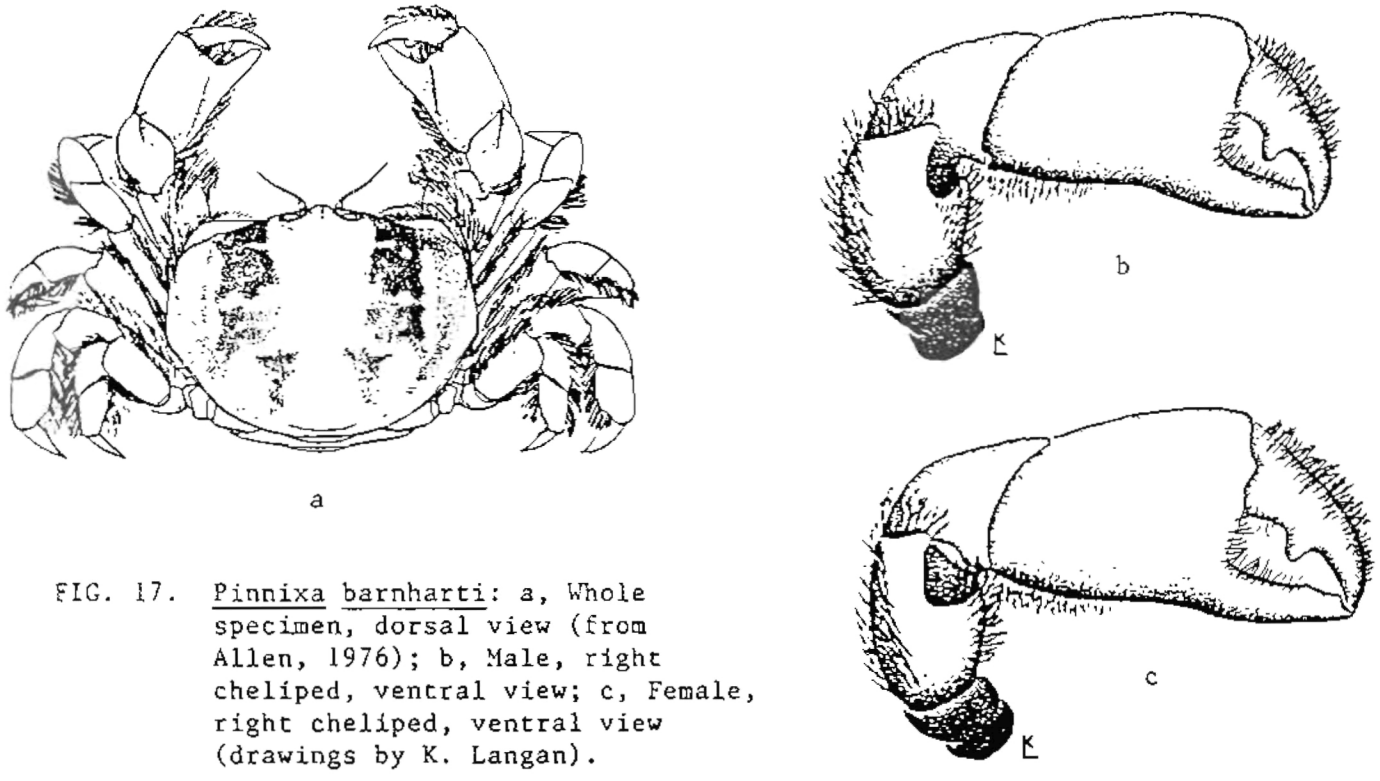


FIG. 17. Pinnixa barnharti: a, Whole specimen, dorsal view (from Allen, 1976); b, Male, right cheliped, ventral view; c, Female, right cheliped, ventral view (drawings by K. Langan).

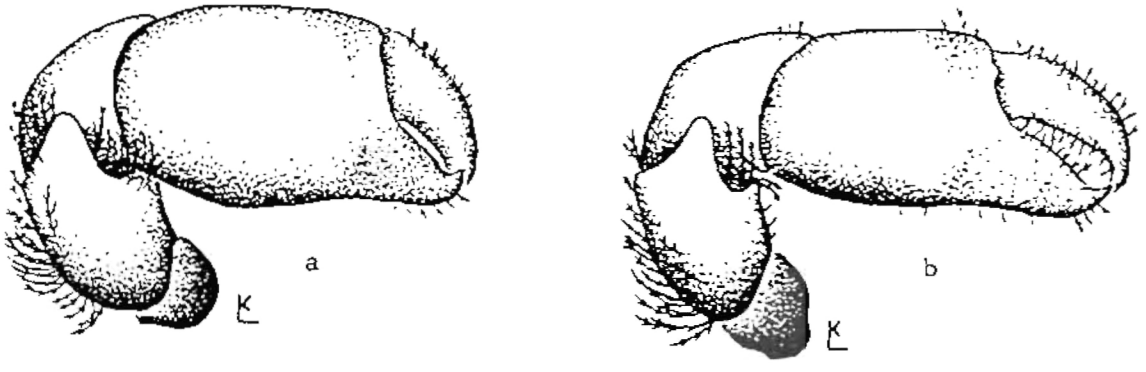


FIG. 18. Pinnixa tomentosa: a, Male, right cheliped, ventral view; b, Female, right cheliped, ventral view (drawings by K. Langan).

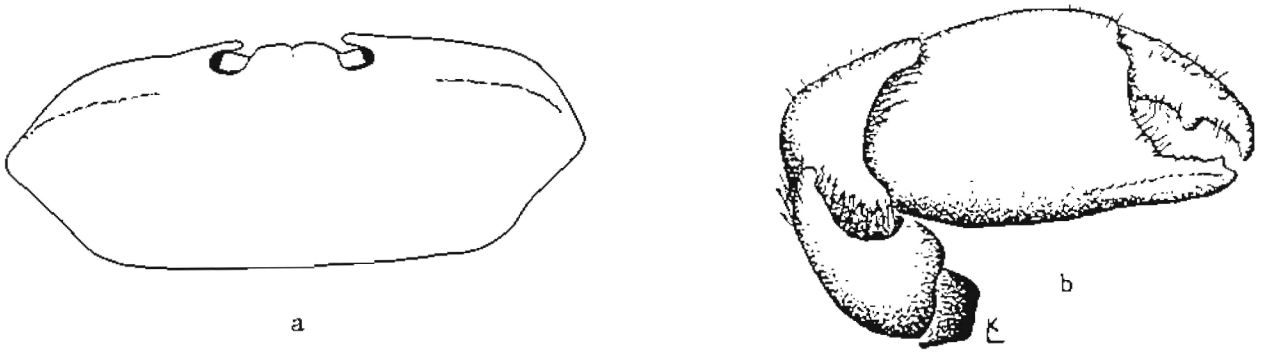


FIG. 19. Pinnixa hiatus: a, Female, dorsal view of carapace; b, Female, right cheliped, ventral view (drawings by K. Langan).

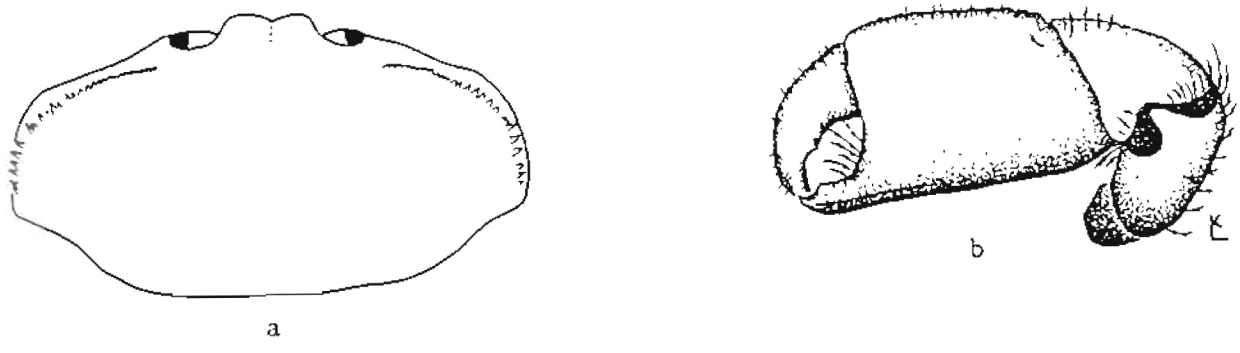
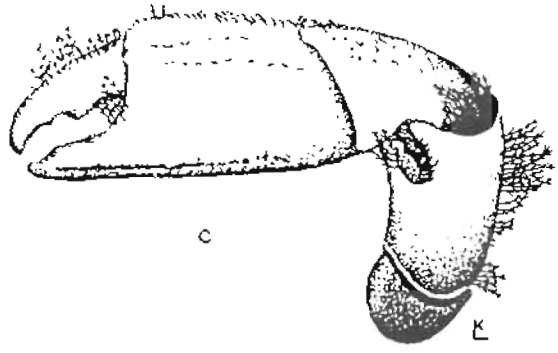


FIG. 20. Pinnixa franciscana: a, Small male, dorsal view of carapace; b, Male, left cheliped, ventral view; c, Female, left cheliped, ventral view (drawings by K. Langan).



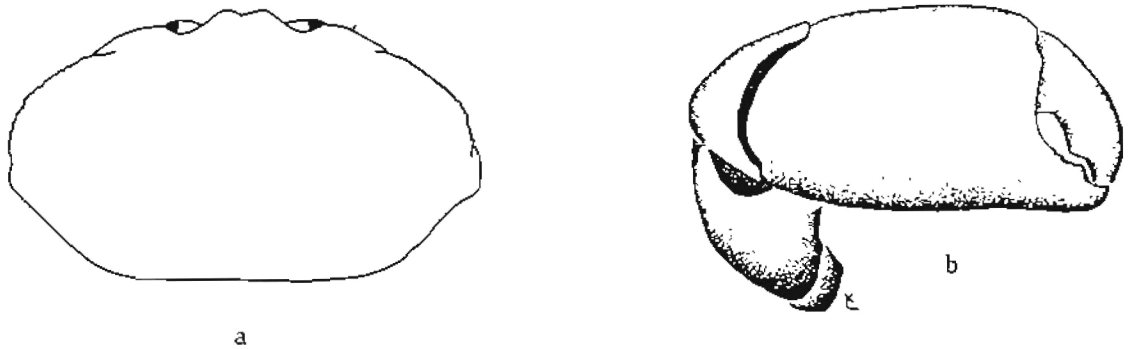


FIG. 21. Pinnixa schmitti: a, Male, dorsal view of carapace; b, Male, right cheliped, ventral view (drawings by K. Langan).

KEY TO THE SPECIES OF *CIROLANA* KNOWN FROM CALIFORNIA

Richard C. Brusca, 1989

1. Uropodal rami without deep apical notch; margin of pleotelson with 10-36 spines; pleotelson of male with a pair of submedian dorsal tubercles ..... *C. harfordi*

   - Both uropodal rami with deep apical notch; margin of pleotelson with 8-10 spines; pleotelson of male without dorsal tubercles 2

2. Penes small, set well apart on sternite 7, each set in line with the middle of the peduncle of the right and left first pleopods; apex of male appendix masculinum bluntly round to subacute; pleotelson with 8-10 spines; left maxilliped with 1 coupling hook, right with 2 coupling hooks .... *C. diminuta*

   - Penes small, set close together on sternite 7, each set in line with the medial margin of the peduncle of the right and left first pleopods; apex of male appendix masculinum acute, often tapering to a filamentous distal thread; pleotelson with 8 spines; left maxilliped with 2 coupling hooks, right with 1 coupling hook ..... *C. parva*

PROVISIONAL KEY TO THE SPECIES OF *GNATHIA* KNOWN FROM CALIFORNIA

Richard C. Brusca 1989

1. Pleotelson triangular or subtriangular in outline 2

   - Pleotelson T-shaped 5

2. No epimeres visible on pleomeres in dorsal aspect; mandible with large, distinct, outer tooth; with well-developed eyes, never set on ocular peduncles, but may be on ocular lobes 3

   - Pleomeres with distinct epimeres, either small, truncate, and ventrally directed, or subacute and laterally directed; mandible without a lateral tooth, or with a minute, weakly-developed outer tooth; without eyes, or if eyes present they are set on distinct ocular peduncles 4

3. Body with distinct separation between pereonites 2 and 3; outer mandibular tooth large and crenulate on inner margin; dorsum of cephalon not tuberculate; pereon straight-sided (pereonites all about same width); eyes may be on ocular lobes ..... *G. steveni* Menzies, 1962
   (At least Redondo Beach to Bahia San Quintin, Baja; shallow water)

   - Body not separated between pereonites 2 and 3; outer mandibular tooth modest, without crenulate margin; dorsum of cephalon weakly tuberculate; pereon tapering posteriorly (pereonites narrowing posteriorly); eyes never on lobes or stalks ..... *G. tridens* Menzies & Barnard, 1959
   (At least Pt. Conception to San Clemente; perhaps to Alaska)

4. Without eyes; frontal margin of cephalon (frons) trilobed; pleonal epimeres small, truncate, and ventrally-directed; body without distinct separation between pereonites 2 and 3 ..... *G. coronadoensis* Schultz, 1966
   (So far reported only from southern California; 344-812 m)

   - With eyes; frontal margin of cephalon (frons) not lobed, but minutely crenulate; pleonal epimeres subacute, laterally directed; body with distinct separation between pereonites 2 and 3 ..... *G. crenulatifrons* Monod, 1926
   (At least Monterey Bay south to Oceanside; 9-1260 m)

5. Eyes set on distinct ocular peduncles; frontal margin of cephalon (frons) 4-lobed; pleonal epimeres in double pairs (a pair of ventrally-directed and a dorsally-directed epimeres on each pleomere) ..... *G. clementensis* Schultz, 1966
   (Reported only from the type locality, San Clemente Canyon; 162 m)

- Eyes not on ocular peduncles; frontal margin of cephalon (frons) 1 or 3-lobed; pleonal epimeres in single pairs (double pairs may be present in G. sanctacrucis) 6

6. Frontal margin of cephalon (frons) produced into a single large lobe; dorsum of cephalon (and entire body) strongly hirsute; pleotelson with a pair of large subapical setae; pleonal epimeres truncate ..... G. sanctacrucis Schultz, 1972 (=G. hirsuta Schultz, 1966) (Reported only from the type locality, Santa Cruz Canyon; 218 m)

- Frontal margin of cephalon (frons) trilobed; dorsum of cephalon not strongly hirsute; pleotelson with or without a pair of subapical setae; pleonal epimeres subacute 7

7. Dorsum of cephalon tuberculate; pleotelson without a pair of subapical setae; with or without eyes..... ..... G. triloba Schultz, 1966 (Reported only from the type locality, Coronado Canyon and La Jolla Canyon: 812-976 m)

- Dorsum of cephalon not tuberculate; pleotelson with a pair of subapical setae (not set side-by-side, but off-set from one another); with eyes .... G. productatridens Menzies & Barnard, 1959 (At least Pt. Conception to southern California; 23-200 m)

PROVISIONAL KEY TO THE CALIFORNIA SPECIES OF *LIMNORIA* KNOWN FROM CALIFORNIA

Richard C. Brusca, 1989

1. Left mandible without a rasp; antennal flagellum 5-articulate; pleonite 5 with pair of longitudinal carinae which converge posteriorly and are transversely connected by a short raised carina; burrow into algal holdfasts ..... *L. algarum*

   - Left mandible with a rasp; antennal flagellum 4- or 5-articulate; pleonite 5 not as above; burrow into wood 2

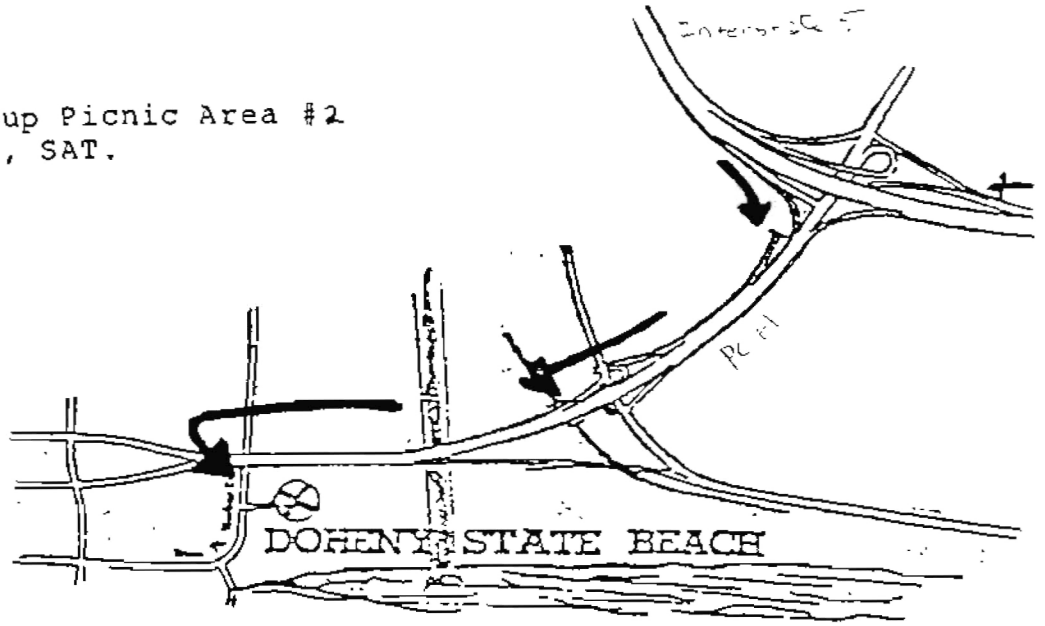
2. Antennal flagellum 4-articulate; pleonite 5 with a single longitudinal carina ..... *L. lignorum*

   - Antennal flagellum 5-articulate; pleonite 5 with two longitudinal carinae that converge or cross 3

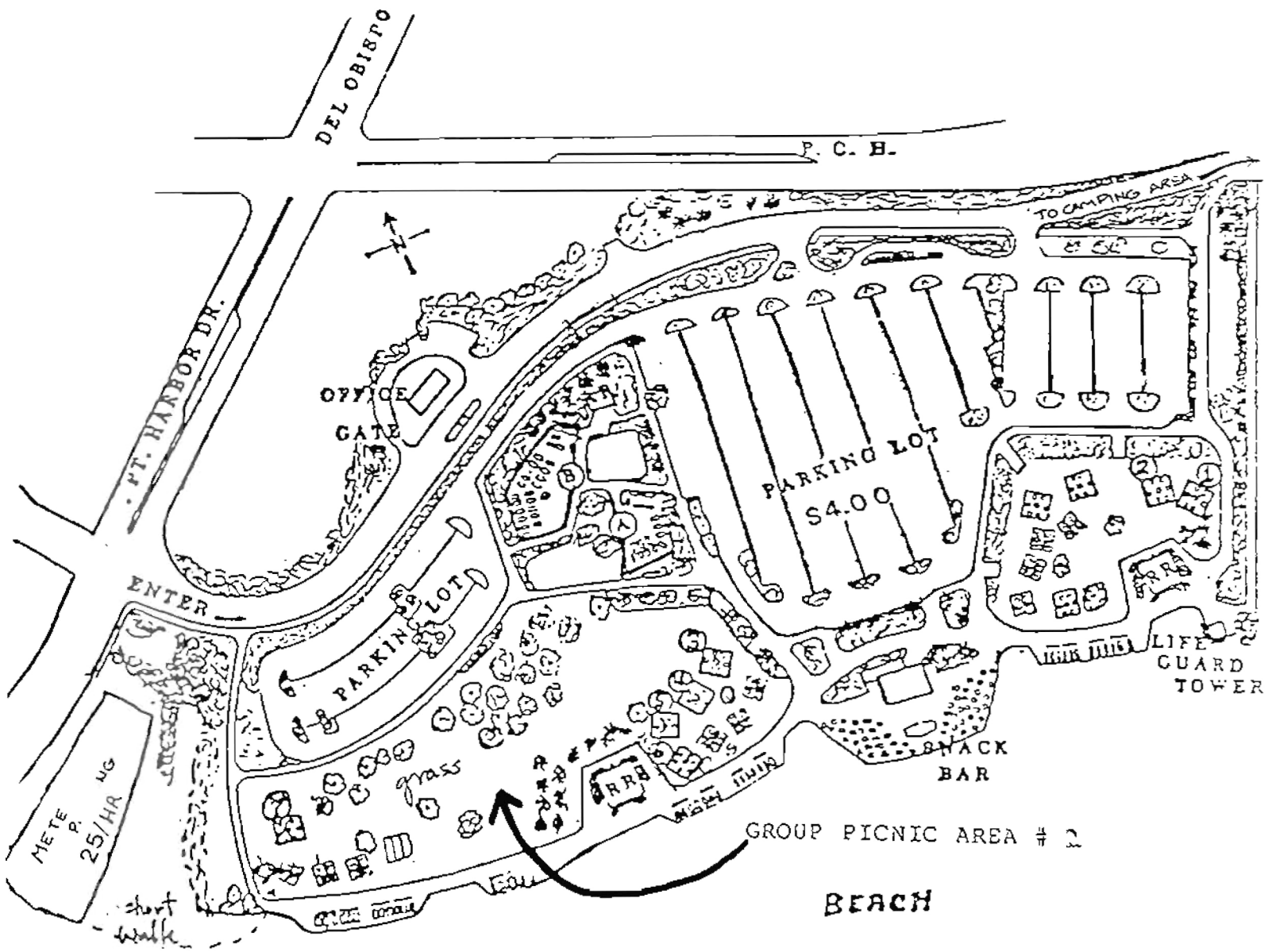
3. Pleonite 5 with two carinae that cross in an X-shape, with the anterior axes longer than the posterior axes; pleotelson without a row of submarginal tubercles; uropod peduncle without prominent lateral tubercles ..... *L. quadripunctata*

   - Pleonite 5 with an anterior pair of nodes or broad puncta, followed by carinae with converge posteriorly to a single node; pleotelson with a row of submarginal tubercles; uropod peduncle with prominent, blunt, lateral tubercles ..... *L. tripunctata*

SCAMIT has reserved Group Picnic Area #2
from 10 a.m. to 10 p.m., SAT.



Take Interstate 5
to the Pacific Coast Highway/Camino Las Ramblas off ramp.



NATURAL HISTORY MUSEUM

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The Department of Marine Invertebrates has an immediate opening for a half-time
CURATORIAL ASSISTANT

The incumbent will perform a variety of both technical and routine duties involving specimen preparation, collections care, and office/lab maintenance. Routine assignments are of a continuing nature; new and special assignments may require initial supervision and guidance. The incumbent participates in professional curatorial activities under the general supervision of the Collection Manager or Curator.

RESPONSIBILITIES

Performs a variety of duties involving the physical curation and technical management of departmental collections, including participation in preserving, restoring, documenting, sorting, and identifying specimens.

Assists in processing acquisitions, incoming and outgoing loans, exchanges, etc. Processes specimens for storage and files them in the appropriate area of the collection. Prepares specimen labels and accession and loan forms. May be charged with maintenance of departmental loan records and other record-keeping tasks.

Prepares specimen catalogue data, using labels, field notes, expedition reports, and other sources as necessary. Computerizes data where applicable, and proofs catalogue entries and printouts at required stages of completion.

Provides assistance to departmental visitors. Answers questions from the public and scientific community as requested.

May supervise Museum Technicians and departmental volunteers.

Assists in maintaining departmental library and other research resources.

Other duties as assigned.

MINIMUM REQUIREMENTS

Bachelor's degree in biology (or equivalent) and two years of experience in collections care. This position requires an active interest in marine invertebrates, and the incumbent must have experience with or extensive knowledge of the techniques used in the study of molluscs and their contemoporary collection care needs. The incumbent must be able to independently access relevent resources and should have both computer word- and data-processing experience. *Attention to detail, resourcefulness, initiative and self-motivation are essential.* The candidate must have a demonstrated ability to carry out assignments efficiently and independently with minimal supervision.

Our research collections comprise approximately 4.8 million invertebrate specimens (215,000 lots), of which 1.8 million are molluscs and 3 million are non-molluscs (mostly Crustacea). The emphasis is on adding wet preserved, expeditionary collected material. With approximately 20% annual collections growth, this curatorial position requires an incumbent to assist with some physical labor (e.g. climbing ladders, moving cases, etc.).

Please send letter of interest, resumé and 2 letters of reference to: Dr. Richard C. Brusca, Bailey Curator and Department Chairman, Department of Marine Invertebrates, at the above address. Hours may be flexible to accommodate academic schedule; salary $6.50 per hour; position available immediately, open until filled.

7/8/89rw