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THE APSEUDID CHELIFERA OF THE EASTERN TROPICAL AND NORTH TEMPERATE PACIFIC OCEAN

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No. 9 — *The Apseudid Chelifera of the Eastern Tropical and North Temperate Pacific Ocean*[1]

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INTRODUCTION

The crustacean order Tanaidacea (auct. Chelifera) has for years been considered to be constituted by the families Apse and Tanaidae. The recent subdivision of the Tanaidae by Lang into the Tanaidae (*sensu stricto*), and the Paratanaidae suggest a further division of the Apseudidae may also be in order, since is composed of a heterogeneous group of genera. Currently, ho there is no good evidence that a splitting of the Apseudidae made successfully, because the characteristics of too many of its and species are imperfectly known.

The only monographic account treating American Tanaida Richardson's (1905) "A Monograph on the Isopods of North ica", in which the Tanaidacea are considered a suborder of the Is This lumping of the tanaids and isopods into one order represe outdated classification; however, because one finds that classifi in use today it seems desirable that a few of the major differen tween the tanaids and isopods be pointed out.

In the Tanaidacea a carapace is present. This consists of a of the first peraeonal somite with the cephalon. Contained with carapace in a branchial chamber are the "cephalic" gills which of delicate, foliaceous appendages attached to the maxillipeds peraeon consists of only six free somites. The first pair of perae which are attached below the carapace, are invariably chelate eyes are usually located on eyelobes which are separated from the pace. The rami of the uropods are multiarticulate. In complet trast, the Isopoda have no carapace and no cephalic gills, altho some species the first peraeonal somite does fuse with the cep Respiration in the Isopoda is carried out by means of foliaceo pendages called pleopods which are attached in pairs to the s

[1] Contribution No. 104 from the Allan Hancock Foundation, University of Southern nia, Los Angeles, Calif.

of the abdomen or pleon. The first pair of peraeopods of isopods is never chelate although in a few genera, those of the Anthuridae particularly, subchelate peraeopods occur. The eyes of the isopods are invariably fused with the head, and separated eyelobes are not known to occur. The rami of the uropods are usually flattened; each ramus consists of a single article.

The first species to be described from the area under consideration were *Apseudes meridionalis* Richardson (1912a) and *Apseudes tropicalis* Richardson (1912b). Both were collected from below 400 fathoms, the former, off the Galapagos Is., and the latter from off Cape San Lorenzo, Ecuador. These species have not been recorded since. Until the discovery of *Dalapseudes* (Boone 1923), a probable synonym of *Parapseudes*, at Laguna Beach, California, not a single record existed of an apseudid from the Pacific shores of North America. The discovery of *Synapseudes intumescens* Menzies (1949) from Dillon Beach, Marin County, California, brought the number of previously known species from the area under consideration to four.

The writer has examined numerous collections of Tanaidacea from localities north of California. None contained specimens of apseudids and to date these animals are not known from Alaska to the southern border of Oregon. In localities in California and points south apseudids do not seem to be rare. About the only factors which might account for their obscurity up to the present time are their small size and a paucity of investigators interested in the group.

Seven genera are characterized in this paper. Two are described as new. Five of the genera are new to the fauna of the region. Seventeen species are considered in this paper, of which thirteen are described as new to science.

ACKNOWLEDGMENTS

The writer expresses his appreciation to the Director of the Allan Hancock Foundation, Captain Allan Hancock, for his liberal support of this work. Special thanks are due Dr. John S. Garth, in whose laboratory this study was made, for generously yielding valuable research time to discuss with the writer the several taxonomic problems which became apparent during the investigation and for his assistance in the preparation of this manuscript. Mr. Al VanAuker, staff artist, provided the excellent copies of *A. meridionalis* and *A. galapagensis* (Fig. 1) which were taken from Richardson's (1912a, 1912b) original

figures. The assistance of the Museum of Comparative Zool the publication of this paper is particularly appreciated.

Key to the Families of the Tanaidacea

A. First antenna without an accessory flagellum.
  B. Marsupium formed of one pair of oostegites which proceed f proximal inner margin of the fifth pair of peraeopods..... *Ta*
  B¹. Marsupium formed by four pairs of oostegites which proce the proximal inner margin of the second to fifth pairs of pera ..... *Parata*
A¹. First antenna with an accessory flagellum..... *Aps*

Family APSEUDIDAE

As can be seen from the key, the Apseudidae may be told fr Tanaidae and Paratanaidae due to their having an accessory fla on the first antenna. In addition, they usually have a scale at to the second antenna and often have a triarticulate epipod at to the first (gnathopod) and second pairs of peraeopods. The ar scale and epipods are absent from the Tanaidae and Paratanai

Key to the Genera of Apseudidae Known from the Eastern Tropical and North Temperate Pacific Ocean

A. Second antenna without a scale.
  B. Pleon with three somites including telson..... *Synapseudes*
  B¹. Pleon with six somites including telson..... *Pagurapseudes*
A¹. Second antenna with a scale.
  B. Mandibular palp with less than three articles.. *Kalliapseudes*
  B¹. Mandibular palp triarticulate.
    C. First somite of pleon much narrower than other somites ..... *Imitapseudes* n. gen.
    C¹. Somites of pleon all of similar width.
      D. Adult with five pairs of pleopods.
        E. Gnathopod (first peraeopod) of adult with an ..... *Apseudes*
        E¹. Gnathopod of adult without an epipod..... ..... *Cyclopoapseudes* n. gen.
      D¹. Adult with four pairs of pleopods..... *Parapseudes*

* Not treated in this paper. Characteristics after Lang (1949).

Genus APSEUDES Leach

Synonyms. *Apseudes* Leach, 1814, p. 404.
Eupheus Risso, 1816, p. 124.
Rhoëa Edwards, H. Milne, 1828, p. 292.

Type species. *Cancer Gammarus Talpa* Montagu, 1808, pp. 98–99, pl. IV, fig. 6.

Diagnosis. Pleon consisting of six somites including the telson. Adult with five pairs of pleopods. Gnathopod and second peraeopod with an epipod. Second antenna with a scale. Mandibular palp triarticulate. Dactyl of second peraeopod with a simple, pointed apex. Somites of pleon all of similar width. Separated eyelobes, with or without facets, present or absent.

Remarks. The two species of *Apseudes* which Richardson described from the Galapagos and Ecuador were not represented in the collections which I have examined. To date the genus has not been recorded from the coastal area between Point Barrow, Alaska, and San Diego, California.

Key to the Species of Apseudes

A. Each lateral border of the telson with two to five spinelike lateral extensions.
  B. Four to five lateral extensions present on each side of the telson.... ..... *meridionalis* Richardson
  B¹. Two lateral extensions present on each side of the telson..... ..... *galapagensis* Richardson
A¹. Lateral borders of telson lacking spinelike extensions.
  B. Eyelobes lacking..... *pernix* n. sp.
  B¹. Eyelobes present.
    C. Eyelobes with facets and pigment ..... *garthi* n. sp.
    C¹. Eyelobes lack facets and pigment ..... *cedroensis* n. sp.

APSEUDES MERIDIONALIS Richardson

Figure 1A

Apseudes meridionalis Richardson, 1912a, pp. 583–585, 1 text-fig.

Diagnosis. Richardson describes the diagnostic telson as follows: "The sixth or terminal segment is 4 mm. long; at the place of attachment of the uropods it is 1½ mm. wide; at its anterior extremity it is provided with a strong spine, and just behind the middle, with three long spines on either side of the lateral margin; on one side there is a

fourth spine in front of the three lateral spines. On the dorsal just within the anterior lateral spines are two small spines, either side of the median line, and behind these at about the of the segment are two other small spines, one being larger a conspicuous than the other."

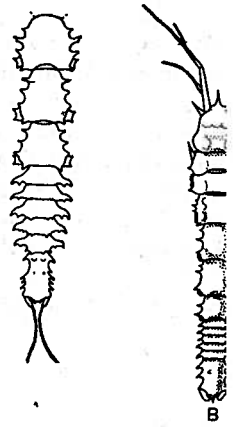

Fig. 1. *A. Apseudes meridionalis* Richardson, posterior half of body X 4⅜ (after Richardson 1912), B. *Apseudes galapagensis* Richardson, magnification not known (after Richardson, 1912).

Remarks. The type and only specimen of this species con the last three peraeonal somites and the pleon; therefore, no known of the anterior peraeonal or cephalic structures. Rich did not describe the structure of the pleopods or posterior p peraeopods. It might be questioned whether the species is *Apseudes*. The peculiar structure of the pleon and telson is teristic and if the species is an *Apseudes* then it probably is va

Type locality. Off Cape San Lorenzo, Ecuador, March 2 (lat. 00° 37′ 00″ S.; long. 81° 00′ 00″ W.) at a depth of 401 f green mud. Collected by the U. S. Bureau of Fisheries S "Albatross". (Richardson 1912a, p. 584).

Location of type. The type is located in the United States N Museum, Washington, D. C., Cat. No. 43504.

Geographic range. Known only from the type locality.

APSEUDES GALAPAGENSIS Richardson

Figure 1B

Apseudes galapagensis Richardson, 1912b, pp. 159–161, figs. 1–2.

Diagnosis. Separated eyelobes present, each with a long, anteriorly directed spine; eyes absent. Outer branch of first antenna with fourteen articles, inner branch with six articles. Second antenna with thirteen articles; scale present. Immovable finger of gnathopod with a triangulate tooth near the articulation of dactyl with propod. Telson "about as long as the four preceding segments taken together; it terminates in an acute point which is upturned. About the middle of the dorsal surface are two spines, one on either side of the median line. The lateral margin is produced on either side in two long, acute processes, one a little below the middle of the segment and the other a little above" (Richardson 1912b, p. 160).

Measurements. None given.

Type locality. Off Chatham Island, Galapagos Islands, April 4, 1888 (Sta. 2807, U. S. Bur. Fish. "Albatross"), depth 812 fms., in globigerina ooze, coral and mud, one specimen (Richardson 1912b, p. 161).

Location of type. The type is located in the U. S. National Museum, Washington, D. C., Cat. No. 43694.

Geographic range. Known only from the type locality.

Remarks. Richardson neither figures nor describes the mouth parts and her description of the peraeopods is inadequate.

APSEUDES GARTHI new species

Figure 2

Diagnosis. Rostral area triangulate sharply pointed. Facet bearing separated eyelobes present, extending onto the dorsal surface of the cephalon. Ocular spines lacking. Medial margin of first article of first antenna with small spines. Inner branch of flagellum of first antenna with two articles; outer with six. Second antenna with ten articles; scale with four apical setae. Immovable finger of gnathopod of male with a triangulate tooth near the articulation of dactyl with propod. Telson as long as the four preceding somites of pleon. Lateral margins of telson bilobate; terminal area between uropods triangulate; dorsal surface lacking spines or spine-like processes. Uropods slightly longer than pleon; exopod with five articles, endopod with thirteen articles. Maxilliped with one coupling hook. Branches of pleopods uniarticulate.

Measurements. Female holotype, length 1.9 mm., width 0.27 mm.

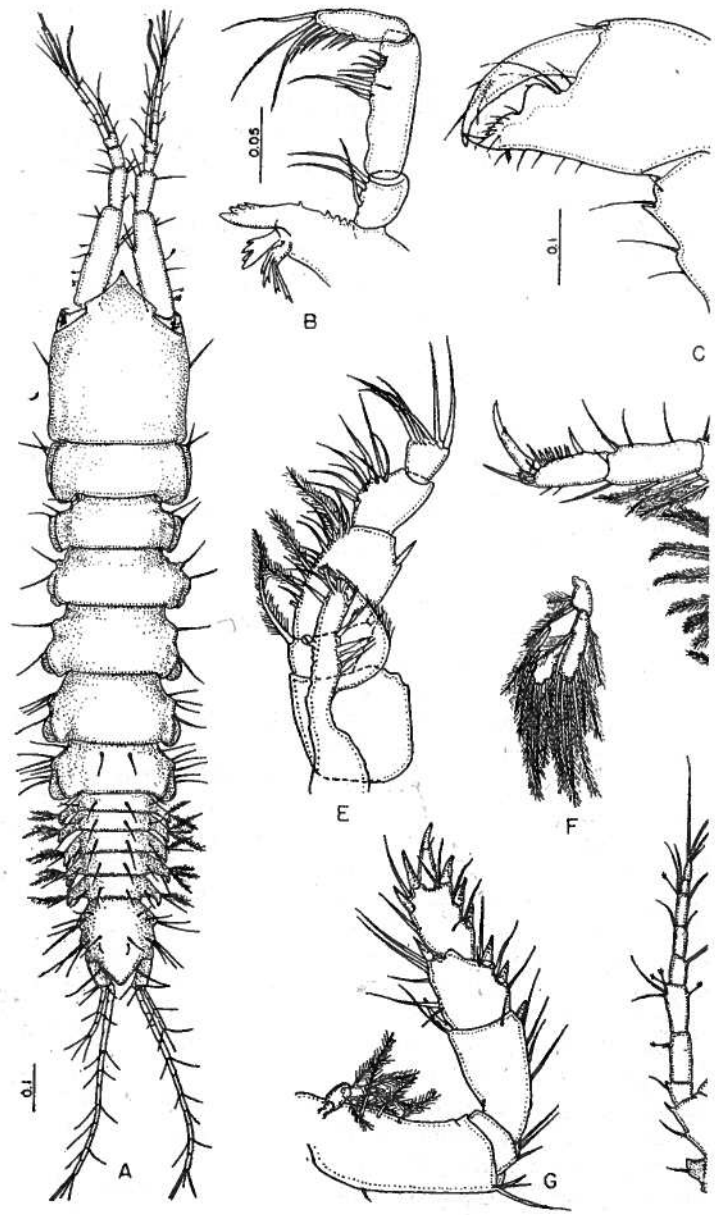

Fig. 2. *Apseudes garthi*, n. sp., holotype. A. toto, B. left ma C. gnathopod of male paratype, D. seventh peraeopod, E. max F. second pleopod, G. second peraeopod, H. second antenna. Figure similar magnification, A; B, E; C, D, F, G, H.

Type locality. San Gabriel Bay, Espiritu Santo Island, Gulf of California, Mexico, March 15, 1949, holotype, from coral heads, AHF Sta. No. 1737–49, with specimens of *Parapseudes pedispinis* (Boone).

Location of type. The holotype is deposited in the collections of the Allan Hancock Foundation, Cat. No. 4911.

Material examined (exclusive of type). Isabel Island, Sinaloa, Mexico, March 19, 1933, 2 specimens from coral, AHF Sta. No. 125–33. These specimens have been designated as paratypes. They are deposited in the collections of the U. S. National Museum, Washington, D. C.

Geographic range. Gulf of California, Mexico, Isabel Island to Espiritu Santo Island.

Remarks. *Apseudes garthi* appears to resemble *A. intermedius* Hansen (1895, pp. 49–50, pls. 5–6) more closely than it does any other species. It differs from *A. intermedius* in having pronounced lateral angles at the base of the rostrum and in lacking the forward projecting antero-lateral borders of the first free somite of the peraeon of *A. intermedius*.

Apseudes pernix new species

Figures 3–4

Diagnosis. Rostral area triangulate, bluntly pointed. Eyes and separated eyelobes lacking. Medial margin of first article of first antenna without spines. Inner branch of flagellum of first antenna with four articles, outer branch with twelve. Second antenna composed of eleven articles; scale with nine marginal setae. Immovable finger of gnathopod with a large sharp tooth on its cutting edge; dactyl with a similar tooth located near the articular margin. Telson as long as the four preceding somites of the pleon; lateral margin of telson unilobate. Distal margin of telson slightly trilobate; dorsal surface lacking spines or spine-like processes. Uropods about one half as long as the body; exopod with eight articles, endopod with about thirty-two articles. Maxilliped with four coupling hooks. Endopod of pleopods with two articles, exopod with one.

Measurements. Male holotype, length 3.4 mm., width 0.4 mm.

Type locality. La Plata Island, Ecuador, January 22, 1933, holotype male and one paratype male, AHF Sta. No. 22-33.

Location of types. The types are deposited in the collections of the

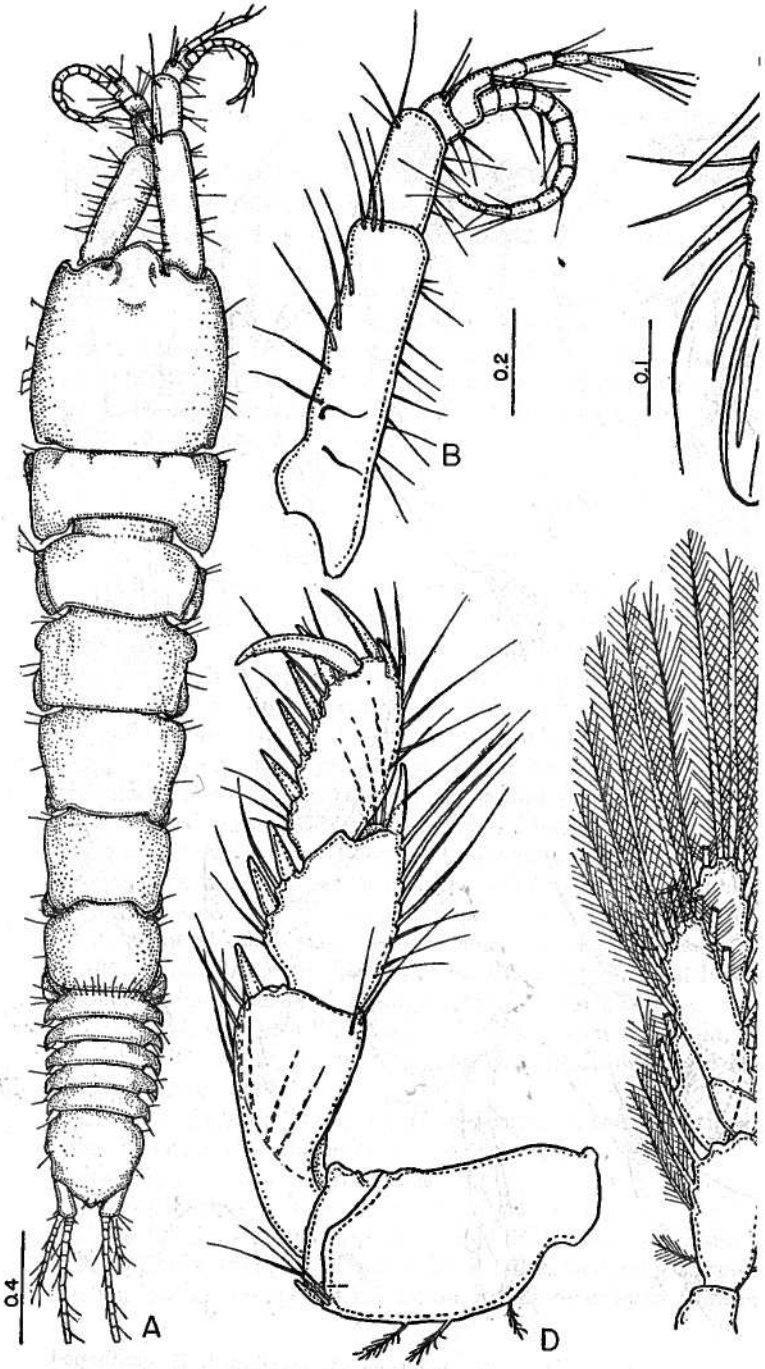

Fig. 3. *Apseudes pernix*, n.sp., holotype, A. toto, B. first antenna, C joints of third peraeopod, D. second peraeopod, E. first pleopod. Figur similar magnification, A; B, D; C, E.

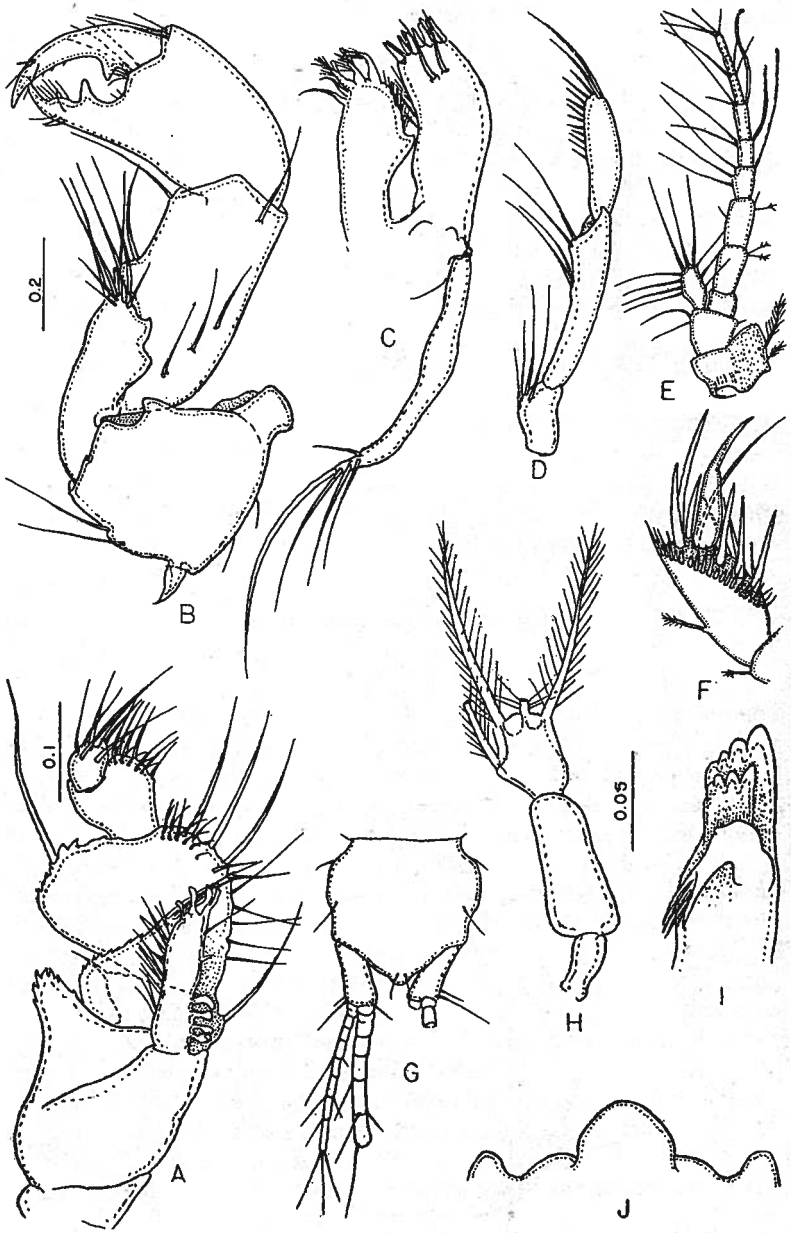

Fig. 4. *Apseudes pernix*, n.sp., holotype, A. maxilliped, B. gnathopod, C. first maxilla, D. mandibular palp, E. second antenna, F. dactyl and propod of seventh peraeopod, G. telson and uropods, H. epipod of second peraeopod, I. inner surface of left mandible, J. frontal margin of cephalon.

U. S. National Museum, Washington, D. C.

Material examined. Types only.

Geographic range. Known only from the type locality.

Remarks. This species shows no close affinity with any of t scribed species. It resembles *A. espinosus* Moore (1901, pp. 16 pl. 7) in general form but, unlike that species, it lacks eyes an rated eyelobes. It resembles *A. caeca* Willemöes-Suhm (187 23–24, pl. XII) in the lack of eyes and separated eyelobes but it markedly from that species in lacking the sharply pointed r and cephalic spines.

Apseudes cedroensis new species

Figures 5–6

Diagnosis. Rostral area triangulate. Separated eyelobes lar tending into dorsal surface; facets lacking. Medial margin article of first antenna with numerous small spines. Inner bra flagellum of first antenna with five articles, outer branch wit articles. Second antenna composed of eleven articles; scale with marginal setae. Immovable finger of gnathopod with a large tooth on its cutting edge; dactyl with a similar tooth not fa articular margin. Telson as long as the four preceding somites pleon; lateral margin of telson not lobed. Distal margin of telso one medial lobe; dorsal surface lacking spines or spine-like pro Uropodal exopod with seven to eight articles; endopod with t five to twenty-six articles; maxilliped with four coupling Endopod of pleopods with two articles, exopod with one.

Measurements. Male holotype, length 7.0 mm., width 1.(Allotype, female, length 7.5 mm., width 1.0 mm.

Type locality. South Bay, Cedros Island, Lower California, M April 19, 1951, holotype, allotype, and two paratypes, 16–19 fa AHF Sta. Nos. 2026–51.

Location of types. The types are deposited in the collections Allan Hancock Foundation, Cat. No. 511, 511a.

Material examined. Types only.

Geographic range. Known only from type locality.

Remarks. This species appears related to *Apseudes espinosus* (1901, pp. 164–165, pl. 7), from which it differs in having a prono median lobe at the apex of the telson, in having evident spines

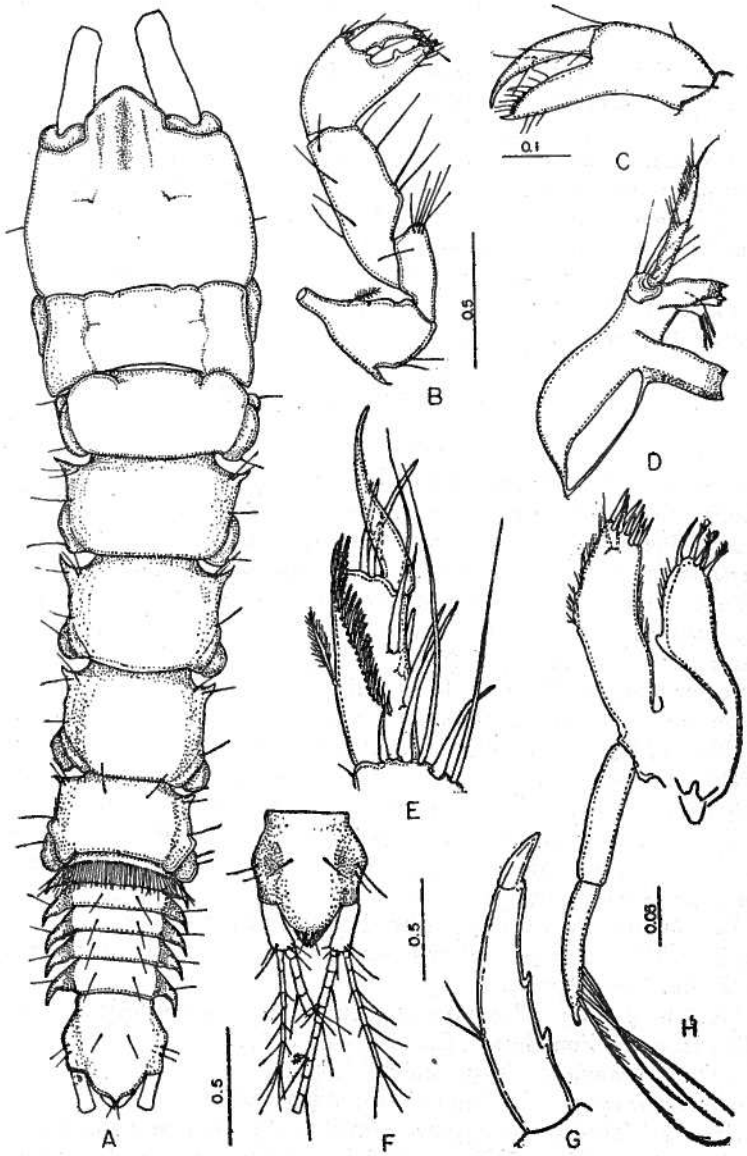

Fig. 5. *Apseudes cedroensis*, paratype male. A. toto, B. gnathopod, C. gnathopod, female, D. left mandible, E. apical articles seventh peraeopod, F. telson, G. dactyl, seventh peraeopod, H. first maxilla. Figures with similar magnification, A; B; C, D; E, G, H; F.

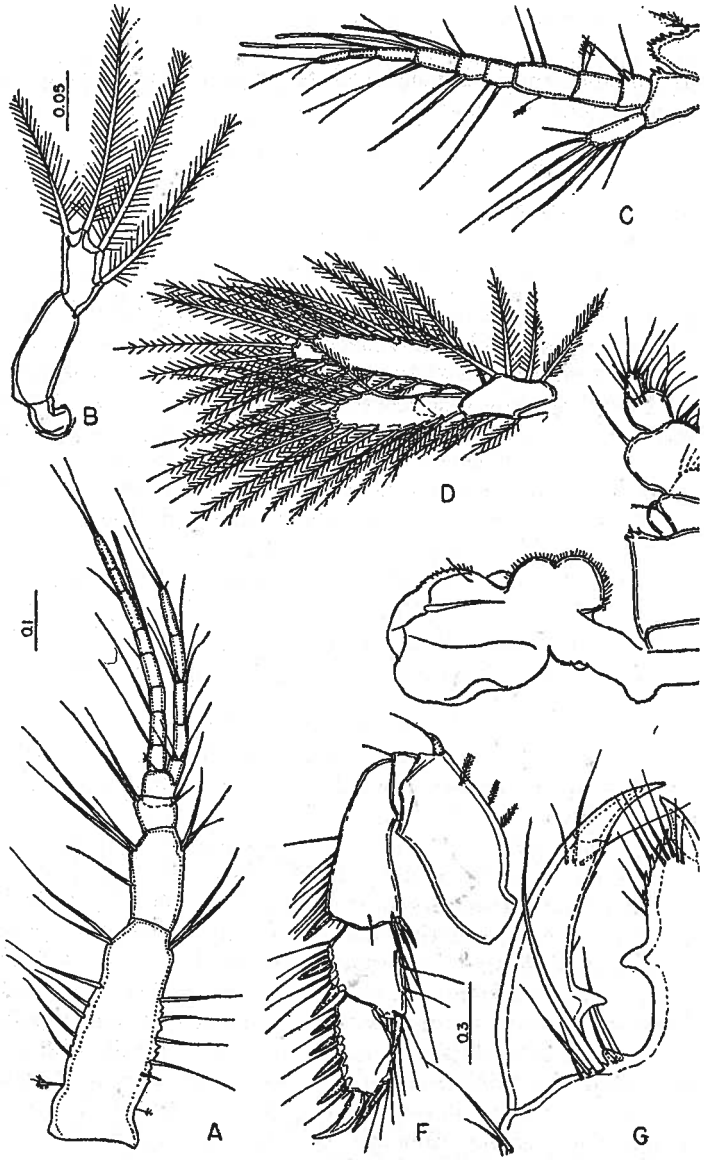

Fig. 6. *Apseudes cedroensis*, paratype male. A. first antenna, B. of gnathopod, C. second antenna, D. first pleopod, E. maxilliped, F. peraeopod, G. apex of gnathopod. Figures with similar magnification, E; B, C, G; F.

peraeonal somites, and in having much fewer articles comprising the branches of the first antennae.

Genus PARAPSEUDES G. O. Sars

Synonyms. Parapseudes G. O. Sars, 1886, p. 303.
Dalapseudes Boone, 1923, pp. 147–148.
Type species. Rhoëa latifrons Grube, 1864, p. 75.

Diagnosis. Pleon consisting of six somites including telson. Adult with four pairs of pleopods. Gnathopod and second peraeopod with an epipod. Second antenna with a scale. Mandibular palp with three articles. Dactyl of second paraeopod sharply pointed, lacking setae.

Remarks. The species assigned to this genus, except perhaps for Grube's *P. latifrons*, which was redescribed by G. O. Sars, are imperfectly known. Those which probably belong to the genus are *P. latifrons* (Grube), *P. goodei* Richardson (1902, pp. 283—284, pl. XXXVII), *P. similis* Vanhöffen (1914, pp. 462—463, fig. 3), *P. pedispinis* (Boone) (1923, pp. 147—148), and *P. neglectus* Miller (1940, pp. 309–311, fig. 5). *P. hirsutus* Stebbing (1910, pp. 89–90) should be transferred to another genus, perhaps to *Apseudomorpha* Miller (1940, p. 315) with which genus it agrees in general aspect and in the lack of pleopods and epipods.

The type of *Dalapseudes pedispinis* is located at the United States National Museum, Washington, D. C. It consists of a mutilated specimen which lacks most of its appendages, including some of the mouthparts and the uropods. This specimen closely resembles *Parapseudes* in general form and in all probability belongs to that genus. Boone's description is inadequate in several instances. She describes the four pairs of paraeopods following the gnathopods as "similar in structure." This is true of the Apseudidae only in the broad sense that the peraeopods have a similar number of articles. That she found no scale on the second antenna is not too remarkable because the second antennal scale of *Parapseudes* is small and could be overlooked easily. The presence of "epipodytes" on the last five pairs of legs, a feature mentioned by Boone in both the generic and specific descriptions, is of some interest. It seems certain that she is referring here to oostegites and not to the structures which are called epipods in this paper. This is indicated for several reasons; first, her "epipodytes" are located medial to the legs, as are oostegites and second, these

"epipodytes" are equal in number to the five pairs of oostegites p
in this species. Also, epipods (as the term is used in this pape
not known to occur on the last five pairs of legs in any known aps

PARAPSEUDES PEDISPINIS (Boone)

Figures 7–9

Synonyms. Dalapseudes pedispinis Boone, 1923, pp. 147–148 (a pı
synonym).

Diagnosis (from specimens examined, not from Boone's descı
or from the holotype). Eyelobes separated from cephalon aı
tending onto the dorsal surface; each with about ten facets. Pe
of first antenna with three articles; first thick, about two tim
length of second. Inner branch of flagellum with seven to
articles; outer with six to seven articles. Second antenna with
or twelve articles. Posterior margin of telson trilobate. Max
with two coupling hooks. Epipod of gnathopod with three aı
apical article with six plumose setae on distal margin.

Measurements. One male (not holotype) 3.4 mm. in lengt
0.8 mm. in width; ovigerous female, length 3.5 mm., width 0.8
figured specimen, length 4.3 mm., width 1.0 mm. (Boone did nc
measurements but the holotype is similar in size to other spe
which I have seen).

Type locality. Laguna Beach, California, collected by Dr. W
A. Hilton (Boone, 1923, p. 148).

Location of type. The holotype is in the collections of the
National Museum, Washington, D. C.

Material examined. CALIFORNIA. *Laguna Beach*, holotyp
Jolla, November 1, 1949, 6 specimens, on *Phyllospadix*, R. J. M
One mi. NW of White Cove, *Santa Catalina Island*, August 4,
49 specimens, on the algae *Lithothrix*, *Eisenia*, and *Macrocystis*
Sta. No. 1378–41. Four mi. east of landing, *Santa Barbara I*
August 28, 1941, 76 specimens, 40 fms,. AHF Sta. No. 1398–41

MEXICO. Gulf of California, *Isabel Island*, March 19, 1
ovig. female, on coral, AHF Sta. No. 125–33. *Turner's Island*,
of Tiburon Island, January 24, 1940, 1 male, AHF Sta. No. 10

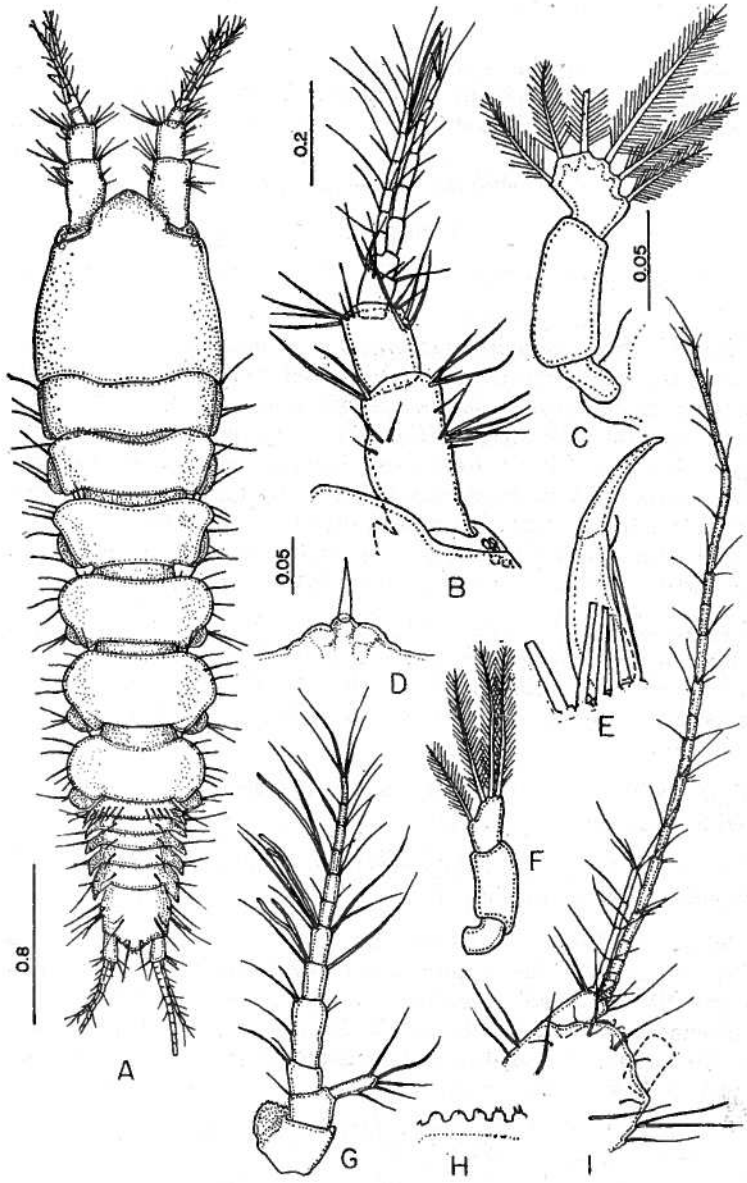

Fig. 7. *Parapseudes pedispinis* (Boone), male, A. toto, B. first antenna and eye, C. epipod of second peraeopod, D. penis, E. dactyl of seventh peraeopod, F. epipod of gnathopod, G. second antenna, H. distal margin of first article of second antenna, I. telson and uropod. Figures with similar magnification, A; B, G, I; C, E, F, H; D.

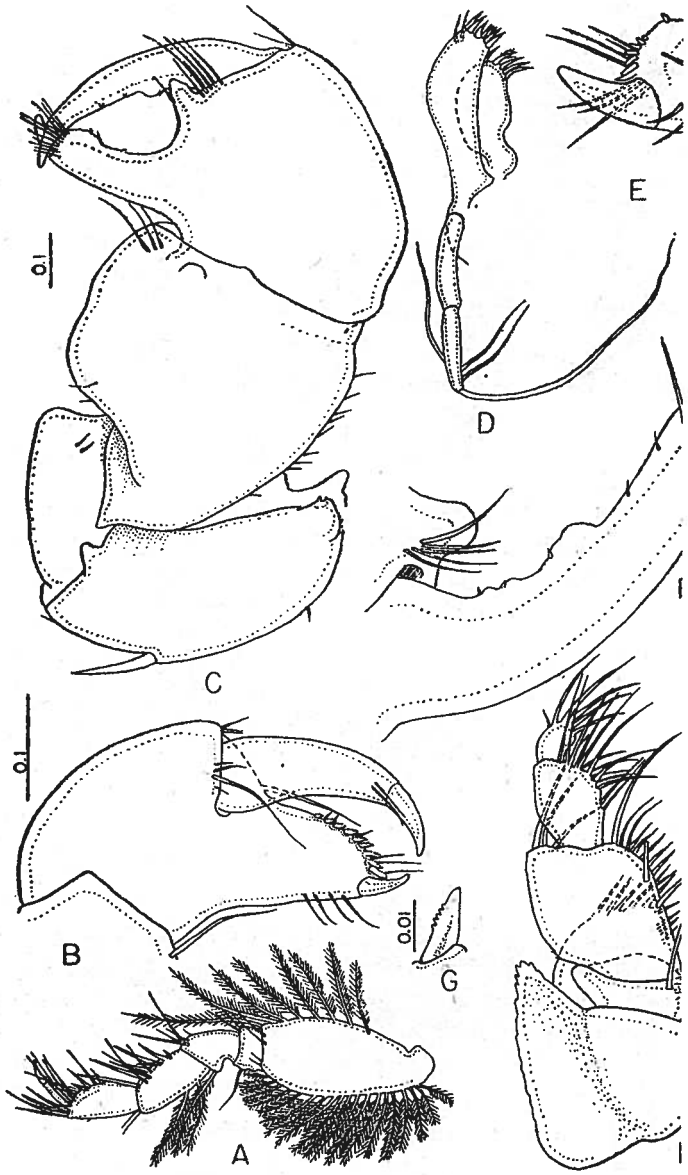

Fig. 8. *Parapseudes pedispinis* (Boone), A. seventh peraeopod, B gnathopod, C. male gnathopod, D. first maxilla, E. apex of immovab of male gnathopod, F. dactyl of male gnathopod, G. seta of superior of immovable finger of female gnathopod, H. maxilliped. Figures with magnification, A, C; B, D, E, F, H; G.

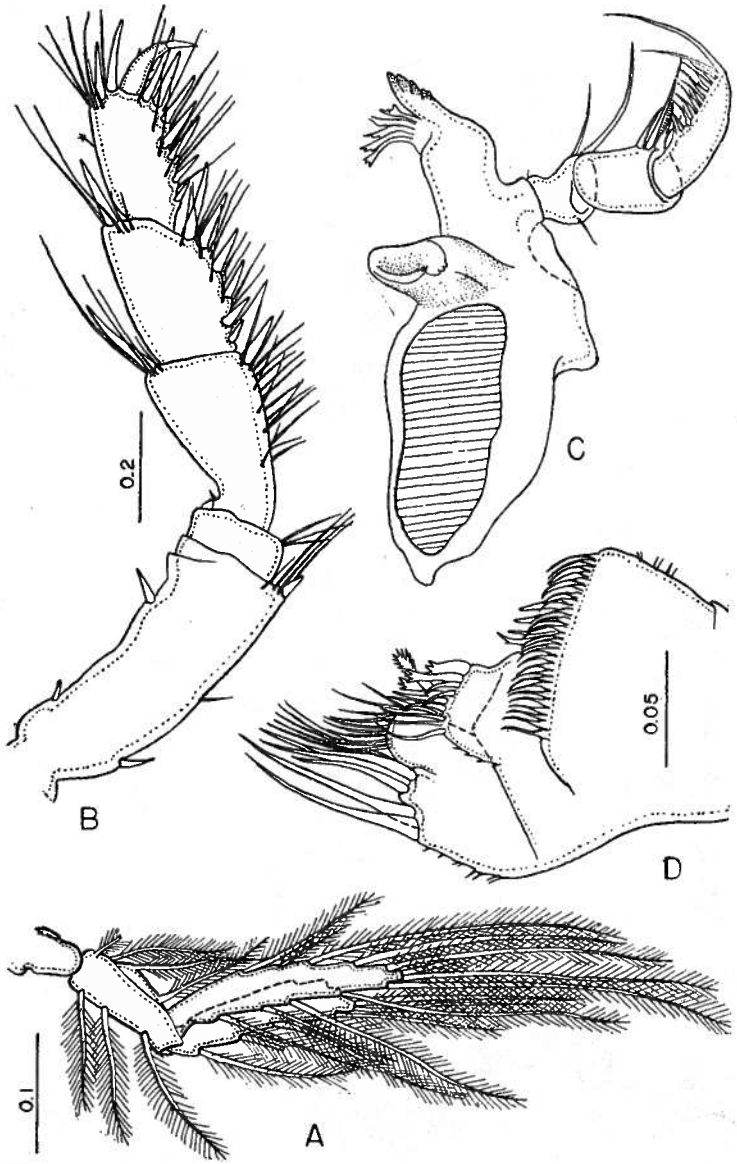

Fig. 9. *Parapseudes pedispinis* (Boone), male, A. first pleopod, B. second peraeopod, C. right mandible, D. second maxilla. Figures with similar magnification, A, C; B, D.

San Gabriel Bay, Espiritu Santo Island, March 15, 1949, 31 spe from coral heads, AHF Sta. No. 1737–49, with *Apseudes garth*

COSTA RICA. *Parker Bay*, February 9, 1935, 50 specim coral, AHF Sta. No. 473–35. *Playa Blancas*, February 8, male, 3–5 fms., AHF Sta. No. 460–35.

COLOMBIA. *Octavia Bay*, January 28, 1935, 1 male, or AHF Sta. No. 435–35. *Gorgona Island*, February 12, 1934, on coral, AHF Sta. No. 222–34; January 22, 1935, 26 specim *Pocillopora*, AHF Sta. No. 411–35.

ECUADOR. *La Plata Island*, February 10, 1934, 24 spe 7–10 fms., AHF Sta. No. 213–34.

Geographic range. Southern California to Ecuador.

Remarks. It is difficult to tell this species from the others have been described and the writer believes that all of the sp the genus will have to be critically examined and the genus before the validity of any can be satisfactorily established. Th ber of articles comprising the branches of the uropods, the nur articles of the antennae, the structure of the mature male gna are features subject to some developmental variation but these teristics are the primary features separating *P. pedispinis* fr other known species at this time.

Genus SYNAPSEUDES Miller

Synapseudes Miller, 1940, p. 311.
Type species. *Synapseudes minutus* Miller, 1940, pp. 311–313, fig. 6.

Diagnosis. Pleon consisting of three somites including the Adults without pleopods. Gnathopods and second peraeopo epipods. Second antenna without a scale. Mandibular palp tri late. Dactyl of second peraeopod with a simple, pointed apex. S of pleon all of similar width. Facets present but eyelobes not sep from the cephalon.

Remarks. All species known from the area under consideratic spines on the inner margin of the first peduncular article of t antenna.

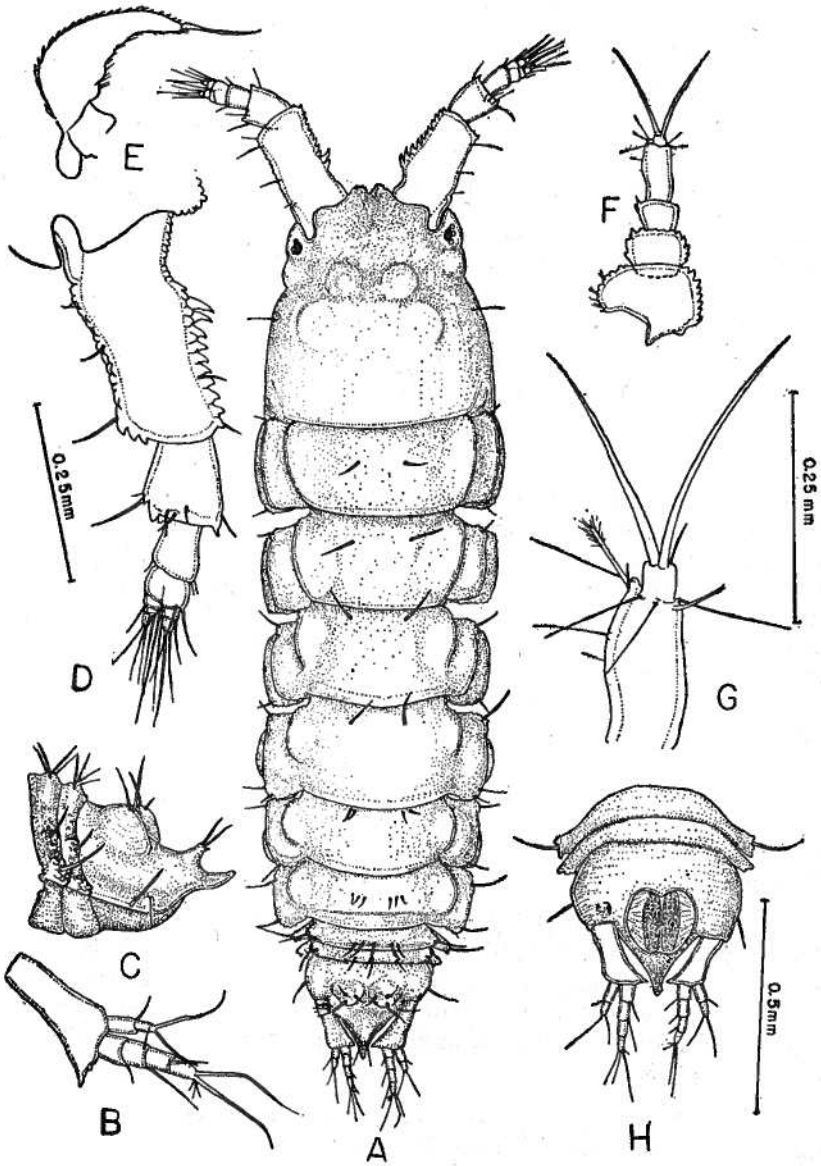

Fig. 10. *Synapseudes intumescens* Menzies, A. toto, B. uropod, C. lateral view of telson, D. first antenna, E. branchial gill of maxilliped, F. second antenna, G. apex of second antenna, H. ventral view of telson. Figures with similar magnification, A; B, D, F; C, H; G, E.

Key to the Species of Synapseudes

1. Second antenna with six articles. Endopod of uropod with three
   B. Dactyl of medium sized male gnathopod with three teeth on margin (Fig. 12C) ..... *rud*
   B¹. Dactyl of medium sized male gnathopod with four teeth on margin (Fig. 14D) ..... *hancock*
A¹. Second antenna with five articles. Endopod of uropod with four
   B. Telson lacks elevated swellings on dorsal surface ..... *dispin*
   B¹. Telson with elevated swellings on dorsal surface .. *intumescens*

Synapseudes intumescens Menzies

Figure 10

Synapseudes intumescens Menzies, 1949, pp. 509–515, figs. 41–42.

Diagnosis. Rostrum bifurcated. Second antenna with five a Endopod of uropod with four articles, exopod with two. Telso an acutely pointed apex, above which is a narrow, cone-s setiferous papilla; lateral and anterior to the cone-shaped papi two widely conical papillae.

Measurements. Holotype female, length 2.0 mm., width 0. Allotype male length 1.6 mm., width 0.4 mm. (Menzies, 1949, p

Type locality. Marin County, California (Menzies 1949, p.

Location of type. U. S. National Museum, Washington, D. C No. 87416.

Material examined. CALIFORNIA. *Point Fermin*, San October 21, 1949, 1 male, in kelp hold-fast, R. J. Menzies. *Anchorage*, Santa Cruz Island, December 30, 1948, 7 specimens Sta. No. 1664–48.

MEXICO. *Guadalupe Island*, Melpomene Cove and 2¼ mi South Bluff, December 17–19, 1949, 44 specimens intertidal to 3 AHF Sta. Nos. 1912–49, 1915–49, 1919–49, 1923–49.

Geographic range. Marin County, California to Guadalupe Mexico.

Remarks. The above specimens extend the range of the speci Monterey Bay, California southward to Guadalupe Island, M Intertidal specimens were collected by washing rocks and alg dilute formalin-seawater. Ovigerous specimens were found in I ber at Guadalupe Island, Mexico.

SYNAPSEUDES RUDIS new species

Figures 11–12

Diagnosis. Rostrum bifurcated. Second antenna with six articles. Endopod of uropod with three articles, exopod with two. Dorsum of telson lacking elevated swellings. Dactyl of medium sized male gnathopod with three teeth on inferior margin, excluding the apical claw as a tooth. Dactyl of large male gnathopod with an apical claw. Posterior border of lateral plate of cephalon separated from posterior border of gnathopodal sclerite by a short distance (Fig. 11 D); two tubercles present along inner margin between the borders.

Measurements. Holotype male, length 1.4 mm., width 0.3 mm. Allotype length 1.25 mm., width 0.25 mm.

Type locality. Melpomene Cove, Guadalupe Island, Mexico, December 18, 1949, holotype, allotype, and 11 paratypes, intertidal, AHF Sta. No. 1915–49.

Location of types. The types are deposited in the collections of the Allan Hancock Foundation, Cat. No. 4913, 4913a.

Material examined (exclusive of types). CALIFORNIA. *Santa Catalina Island,* White Cove, July 18, 1941, 3 specimens, AHF Sta. No. 1367–41; July 20, 1941, 2 specimens, AHF Sta. No. 1370–41; August 4, 1941, 5 specimens, AHF Sta. No. 1378–41, specimens from holdfasts of the kelps *Macrocystis* and *Eisenia.*

MEXICO. West Coast of Lower California, *E. San Benito Island,* April 26, 1950, 1 specimen, AHF Sta. No. 1946–50. *Entrada Point,* Magdalena Bay, May 2, 1950, 9 specimens, AHF Sta. No. 1961–50. Guadalupe Island, *Melpomene Cove* and 2¼ mi. N. of *South Bluff,* December 17, 19, 1949, 47 specimens, AHF Sta. Nos. 1912–49, 1919–49 and 1923–49.

Geographic range. Santa Catalina Island, California, to Guadalupe Island and Magdalena Bay, Lower California, Mexico.

Remarks. This species differs from *S. intumescens* and *S. dispina* in having a greater number of articles comprising the second antenna and in having a fewer number of articles comprising the uropodal endopod.

Most of the specimens were collected from kelp holdfasts in the intertidal zone. At Guadalupe Island specimens were taken from formalin-seawater washings of rocks encrusted with corals and bryozoa.

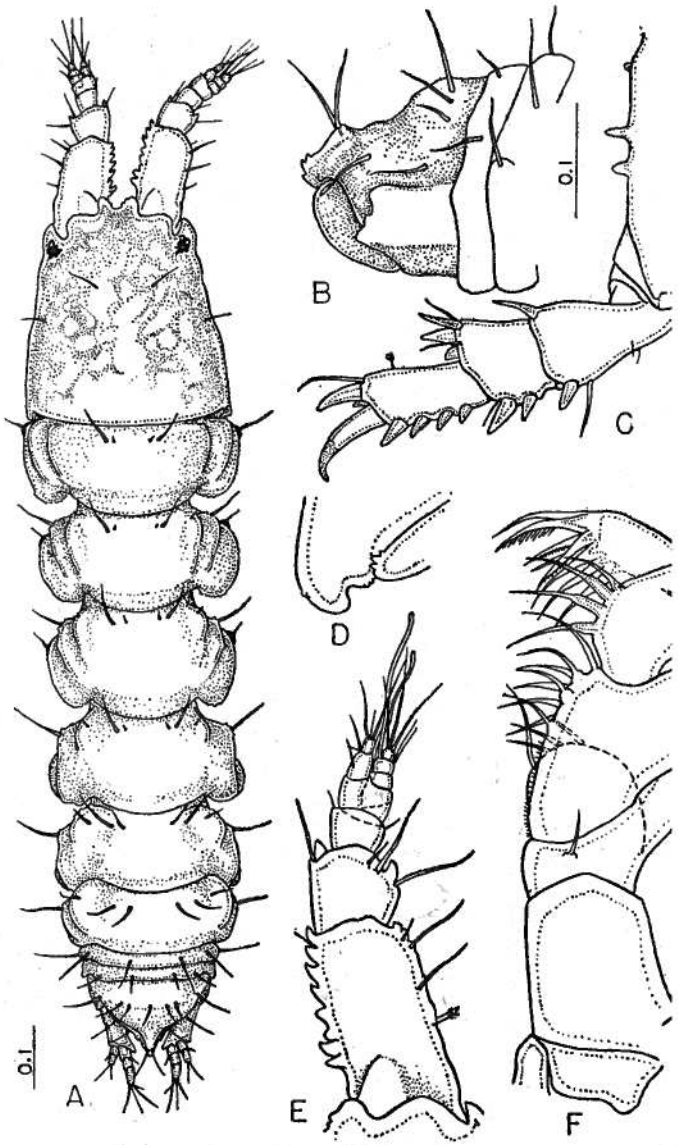

Fig. 11. *Synapseudes rudis,* n. sp., female paratype, A. toto, I view of telson, C. second peraeopod, D. lateral view of union of with peraeon, E. first antenna, F. maxilliped. Figures with simila fication, A; B, C, D, E; F.

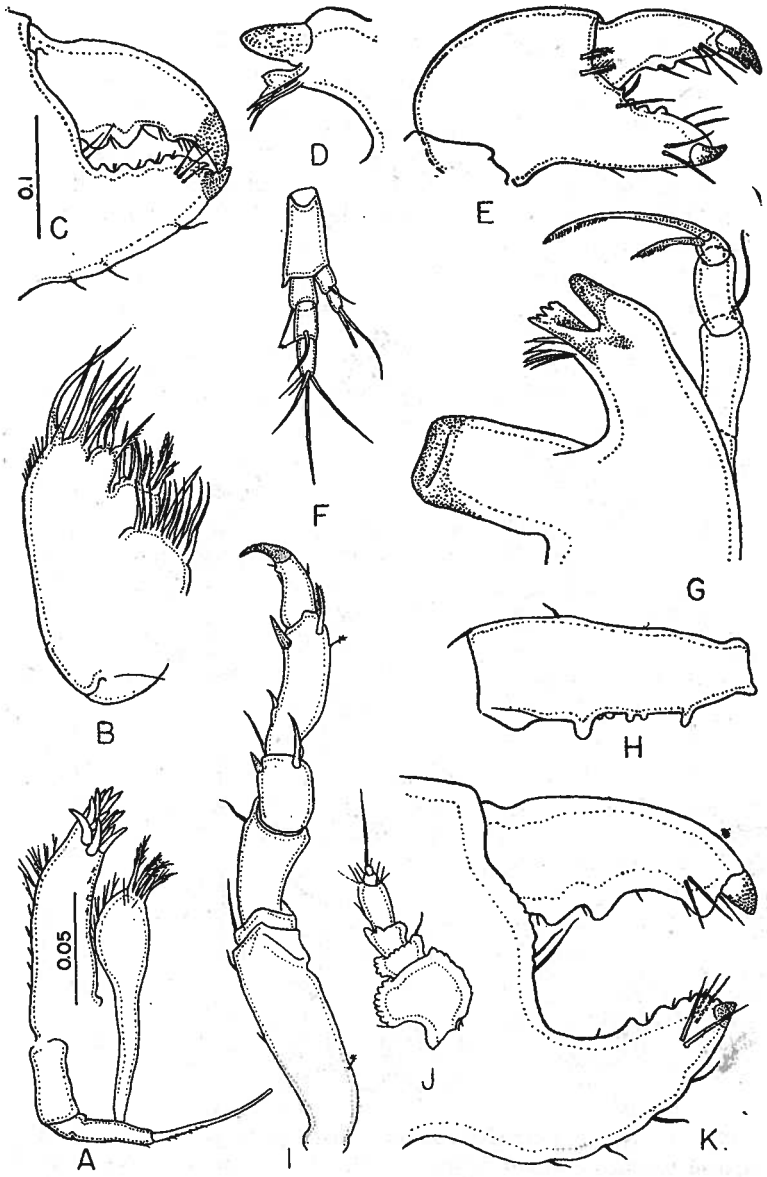

Fig. 12. *Synapseudes rudis*, n. sp., A. first maxilla, B. second maxilla, C. male first gnathopod, D. incisor and setal row of right mandible, E. female gnathopod, F. uropod, G. left mandible, H. basis of second peraeopod of female, I. seventh peraeopod, J. second antenna, K. gnathopod of mature male. Figures with similar magnification, A, B, D, G; C, E, F, H, I, J, K.

SYNAPSEUDES DISPINA new species

Figure 13

Diagnosis. Rostrum bifurcated. Second antenna with five
Endopod of uropod with four articles, exopod with two. Do
telson lacking elevated swellings.

Measurements. Holotype female, length 2.0 mm., width 0.3

Type locality. Asunción Point, Lower California, Mexico, A
1950, 1 female holotype, intertidal, AHF Sta. No. 1950–50.
Benito Island, Lower California, Mexico, April 26, 1950, 1 ma
type, intertidal, AHF Sta. No. 1946–50.

Location of types. The types are deposited in the collection
Allan Hancock Foundation, Cat. No. 506.

Material examined. Types only.

Geographic range. Western coast of Lower California, Mexic
E. San Benito Island to Asunción Point.

Remarks. This species differs from *S. intumescens* Menzies
ing elevated papillae on the dorsum of the telson. It differs
heterocheles (Vanhöffen) because the exopod of the uropod
of two and not one article and the endopod has four and nc
articles. The second antenna figured by Vanhöffen (1914, p. 46
has at least six articles but Vanhöffen states that, "die unteren
nen sind kurz, dreigliedrig . . ." In either case the second ant
S. dispina differs from that of *S. heterocheles* because it consist
articles.

It is conceivable that this species is a geographic varian
intumescens but without further material it is impossible for
tell one way or the other.

SYNAPSEUDES HANCOCKI new species

Figure 14

Diagnosis. Rostrum bifurcated. Second antenna with six
Endopod of uropods with three articles, exopod with two. Do
telson lacking elevated swellings. Dactyl of medium sized male
pod with four teeth, excluding apical claw as a tooth. D
large male gnathopod without an apical claw. Posterior bc
lateral plate of cephalon separated from posterior border of
podal sclerite by a considerable distance (Fig. 14G); ab
tubercles present along inner margin between the borders.

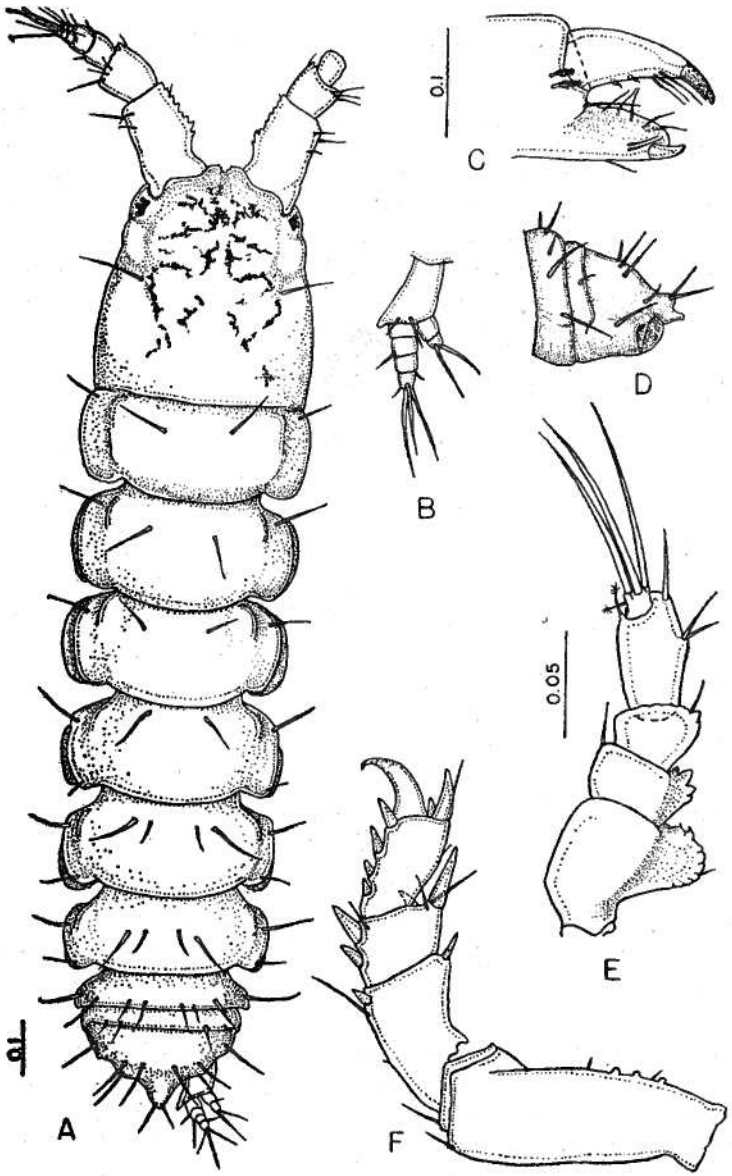

Fig. 13. *Synapseudes dispina*, n. sp., A. toto, B. uropod, C. female gnathopod, D. lateral view of telson, E. second antenna, F. second peraeopod. Figures with similar magnification, A, D; B, C, F; E.

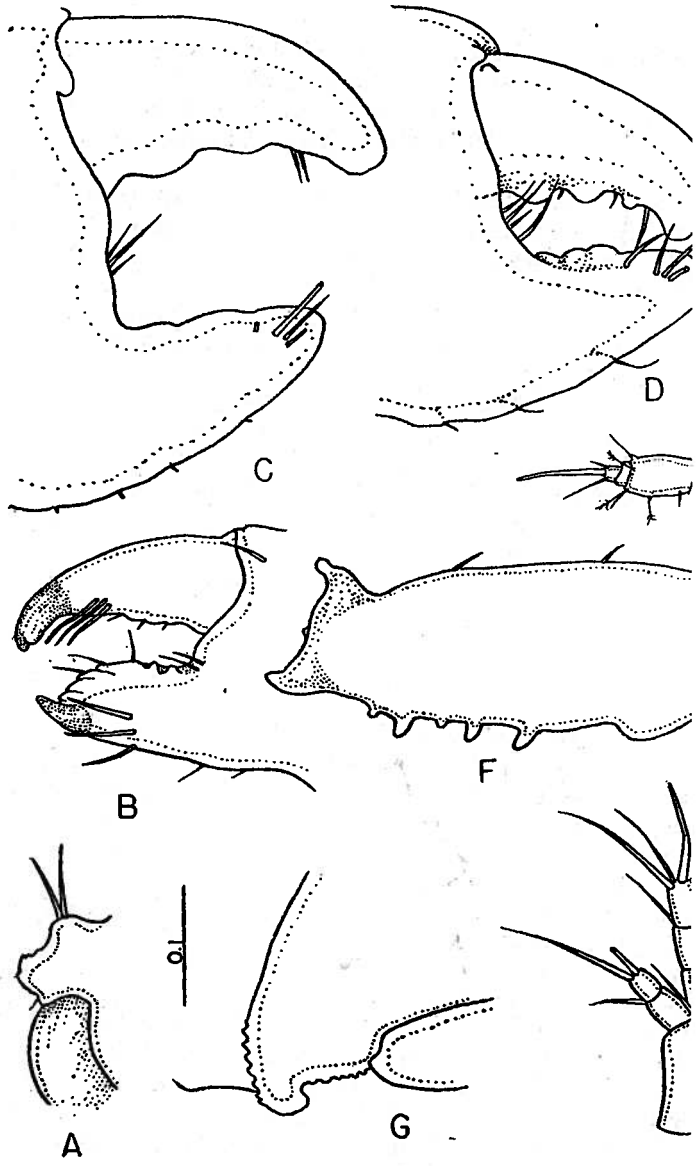

Fig. 14. *Synapseudes hancocki*, n. sp., A. lateral view of apex o B. female gnathopod, C. male gnathopod, D. male gnathopod, articles of second antenna, F. basis of second peraeopod of female, G view of cephalic-first peraeonal somitic union, H. uropod. Figures witl magnification, A, B, C, D, E, G, H; F not known.

Measurements. Holotype male, length 1.8 mm., width 0.3 mm. Ovigerous female allotype, length 1.9 mm., width 0.3 mm.

Type locality. Lobos de Afuera Island, Peru, January 17, 1935, holotype, allotype, and 29 paratypes, intertidal zone, AHF Sta. No. 391–35.

Location of types. The holotype, allotype, and 19 paratypes are deposited in the collections of the U. S. National Museum, Washington, D. C. Ten paratypes are in the collections of the Allan Hancock Foundation.

Material examined (exclusive of types). Tagus Cove, Albemarle Island, Galapagos Islands, January 14, 1934, 1 female, from coral, AHF Sta. No. 152–34.

Geographic range. Galapagos Islands and Peru.

Remarks. The differences which are enumerated in the diagnoses between *S. hancocki* and *S. rudis* seem very slight. They are not differences of sex or age of the specimens and are consistent in the material examined and, therefore, indicate the probability of the distinctness of the species.

Genus PAGURAPSEUDES Whitelegge

Pagurapseudes Whitelegge, 1901, pp. 209–210.
Pagurotanais Bouvier, 1918, pp. 12–15.
Type species. Pagurapseudes spinipes Whitelegge, 1901, pp. 210–215, figs. 16a-h.

Diagnosis. Pleon consisting of six somites including the telson. Adult with zero to three pairs of pleopods. Gnathopod and second peraeopod with an epipod. Second antenna without a scale. Mandibular palp triarticulate. Dactyl of second peraeopod with a simple, pointed apex. Somites of pleon all of similar width. Facet bearing separated eyelobes present.

Remarks. This genus appears to contain two species, *P. spinipes* and *P. bouryi* (Bouvier, *vide* Lang, 1949, p. 4). *P. heterocheles* Vanhöffen has been referred to *Synapseudes* (Menzies, 1949, p. 510).

Pagurapseudes has a coiled abdomen and its members occupy small univalve shells much like the pagurid crabs. This characteristic habit was noted earlier by Whitelegge and Bouvier. Lang's (1949, p. 4) statement that *Pagurapseudes* is "commensal among the Pagurides," is possibly a misinterpretation of Whitelegge's observation that, "It is distinctly paguroid in habit, living in small univalve shells and in company with young hermit crabs."

PAGURAPSEUDES LAEVIS new species

Figures 15–16

Diagnosis. Rostrum triangulate, directed downward, apex
Frontal margin between rostrum and eye with a median tooth.
of gnathopod and second peraeopod with only one article.
margin of ventral surface of eye with cuboidal teeth. Second
of second antenna equals the length of third article. Male w
pair of pleopods; female without pleopods. Tips of gnat
golden in color.

Measurements. Holotype male, length, 2.5 mm., width 0.
Allotype lacking oostegites, length 2.5 mm., width 0.4 mm.

Type locality. California, one mi. NW of White Cove, Santa
lina Island, August 4, 1941, holotype, allotype, and one male pa
AHF Sta. No. 1378–41.

Location of types. The types are deposited in the collections
Allan Hancock Foundation, Cat. No. 413, 413a.

Material examined (exclusive of types). Mexico, Guadalupe
Melpomene Cove, December 19, 1949, 3 specimens, 50–51 fms
Sta. No. 1920–49.

Geographic range. Santa Catalina Island to Guadalupe
Mexico.

Remarks. This species differs from *P. spinipes* in having a t
late and not a truncate rostrum, and in having uniarticulate a
biarticulate epipods. In these respects it resembles *P. bouryi* (Bo
It differs from the latter in having a more acute rostrum and a
antenna with six articles. In *P. bouryi* the rostrum is wide
apex and the second antenna has only five articles (Bouvier
figs. 5, 7).

Genus KALLIAPSEUDES Stebbing

Kalliapseudes Stebbing, 1910, pp. 86–87.
Type species. Kalliapseudes makrothrix Stebbing, 1910, pp. 86–88.

Diagnosis. Pleon consisting of six somites including the
Adult with five pairs of pleopods. Gnathopod and second per
with or without an epipod. Second antenna with a scale. Man
palp with one or two articles. Dactyl of second peraepod with
setiferous apex.

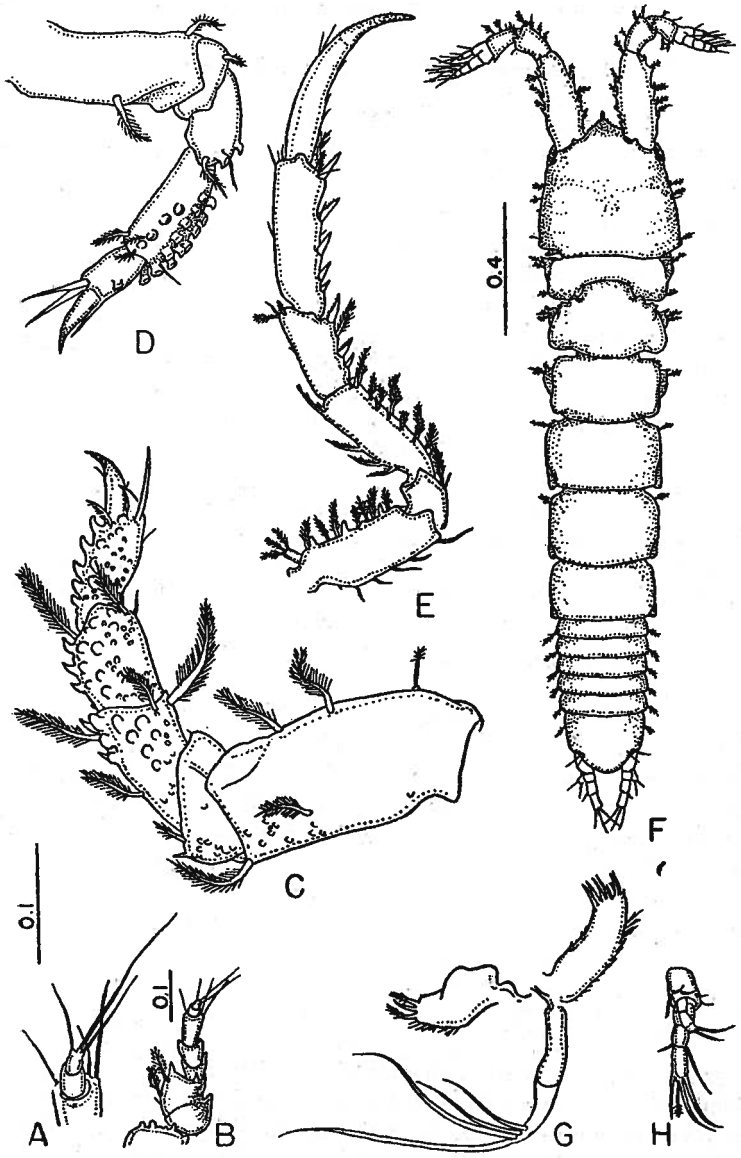

Fig. 15. *Pagurapseudes laevis*, n. sp., A. distal articles of second antenna, B. second antenna, C. third peraeopod, D. seventh peraeopod, E. second peraeopod, F. toto, G. first maxilla, H. uropod. Figures with similar magnification, A, C, D, G; B, E, H; F.

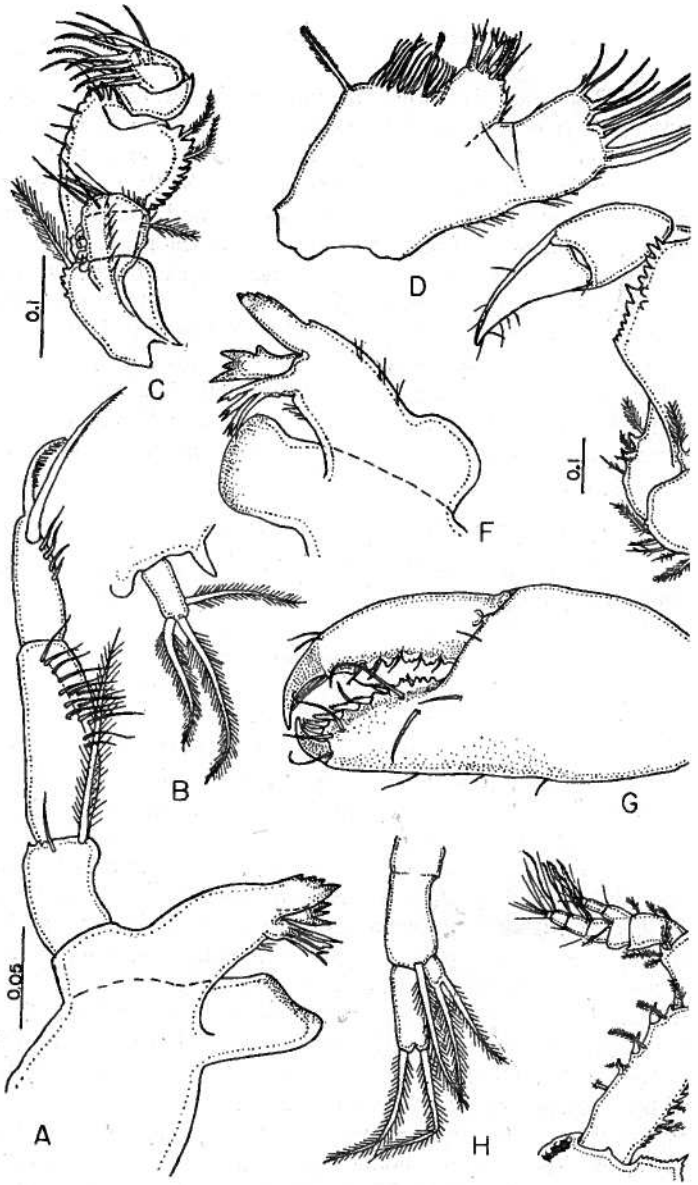

Fig. 16. *Pagurapseudes laevis*, n. sp., A. left mandible, B. epipod of peraeopod, C. maxilliped, D. second maxilla, E. gnathopod, F. left ma G. gnathopod, H. first pleopod, I. first antenna, eye, and rostrum. with similar magnification, A, B, D, F, H; C, G; E, I.

Remarks. This genus is known to contain, in addition to those described herein as new, at least four species, *K. makrothrix* Stebbing (1910), *K. obtusifrons* (Haswell, 1881), *K. primitivus* Nierstrasz (1913), and *K. mauritanicus* Monod (1923). Lang (1949, p. 3) states, "to me it appears to be most probable that *makrothrix* and *primitivus* are identical with *obtusifrons*. The systematics within the genus can only be cleared up, however, by means of ocular inspection of all the species." This latter remark seems very reasonable and indicates the difficult situation in which the systematics of the Tanaidacea are today. On the other hand, the fact that the mandibular palp of *K. makrothrix* is figured as having a short apical article, whereas, Nierstrasz indicates no short apical article on the mandibular palp of *K. primitivus*, is an indication to me that *primitivus* and *makrothrix* are more probably different than identical.

Key to the Species of Kalliapseudes

A. Rostrum pointed. Body largely devoid of pigment, white. . .*crassus* n. sp.
A¹. Rostrum blunt. Body green in color. . . . . .*viridis* n. sp.

KALLIAPSEUDES CRASSUS new species

Figures 17–20

Diagnosis (adult female). Eyes and eyelobes present. Outer branch of first antenna with nine articles, inner with three. Second antenna with eleven articles. Mandibular palp uniarticulate, united along its outer margin with the mandible. Exopod of uropod with three articles, endopod with about eighteen articles. Maxilliped with two coupling hooks. Dactyl of seventh peraeopod apically bifid. Rostrum pointed. Telson with about twenty-two setae on posterior margin. Body with little pigment, white in color. Immovable finger of gnathopod exceeds two-thirds the length of the dactyl.

Measurements. Holotype female, length 8.0 mm., width 1.0 mm.

Type locality. San Quintin Bay, west coast of Lower California, Mexico, April 6–7, 1950, 34 specimens, ovigerous females and young, collected by Charles Horvath, Donald Reish, and R. J. Menzies.

Location of types. The types are deposited in the collections of the Allan Hancock Foundation. Some paratypes have been sent to Dr. Karl Lang, Curator, Naturhistoriska Riksmuseum, Stockholm, Sweden.

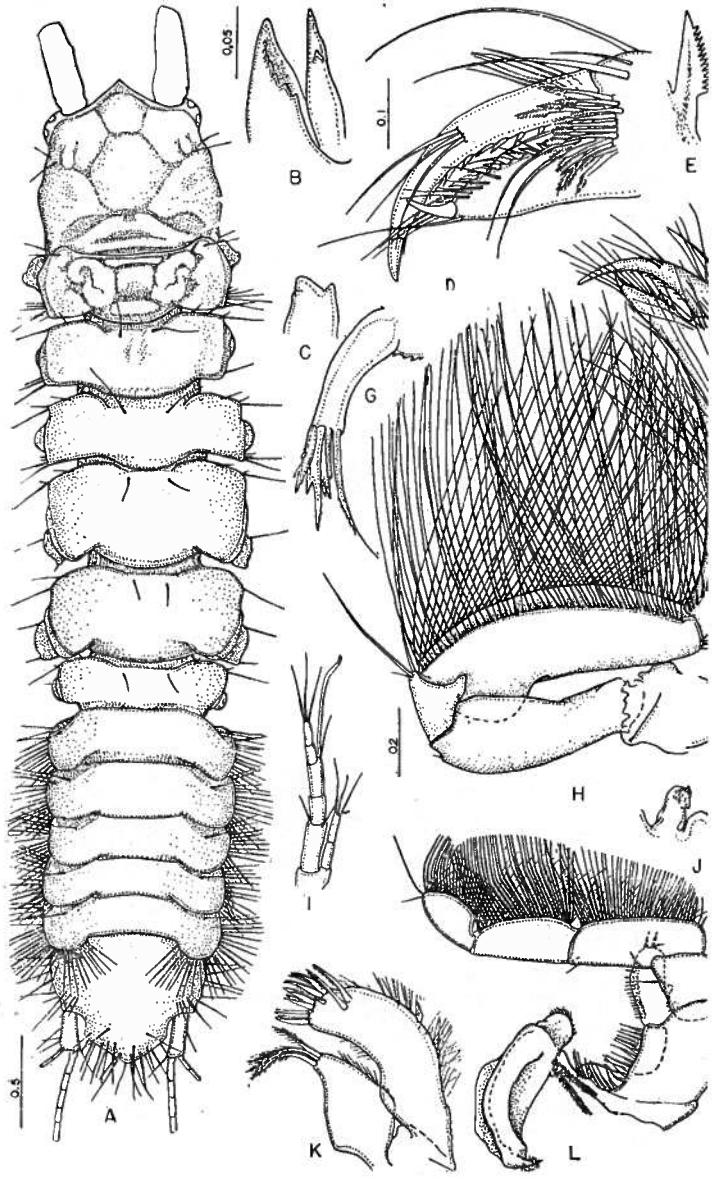

Fig. 17. *Kalliapseudes crassus*, n. sp., female paratype, A. toto, B. parts of left mandible, C. incisor, dorsal view, of right mandible, D. gnath E. tooth of cutting edge of gnathopod, F. seta at articular border of d G. setal row of right mandible, H. gnathopod, I. distal articles of first an of juvenile, J. coupling hooks of maxilliped, K. first maxilla, L. maxil Figures with similar magnification, A; B, C, G, J; D, I, K; E, F; H, L.

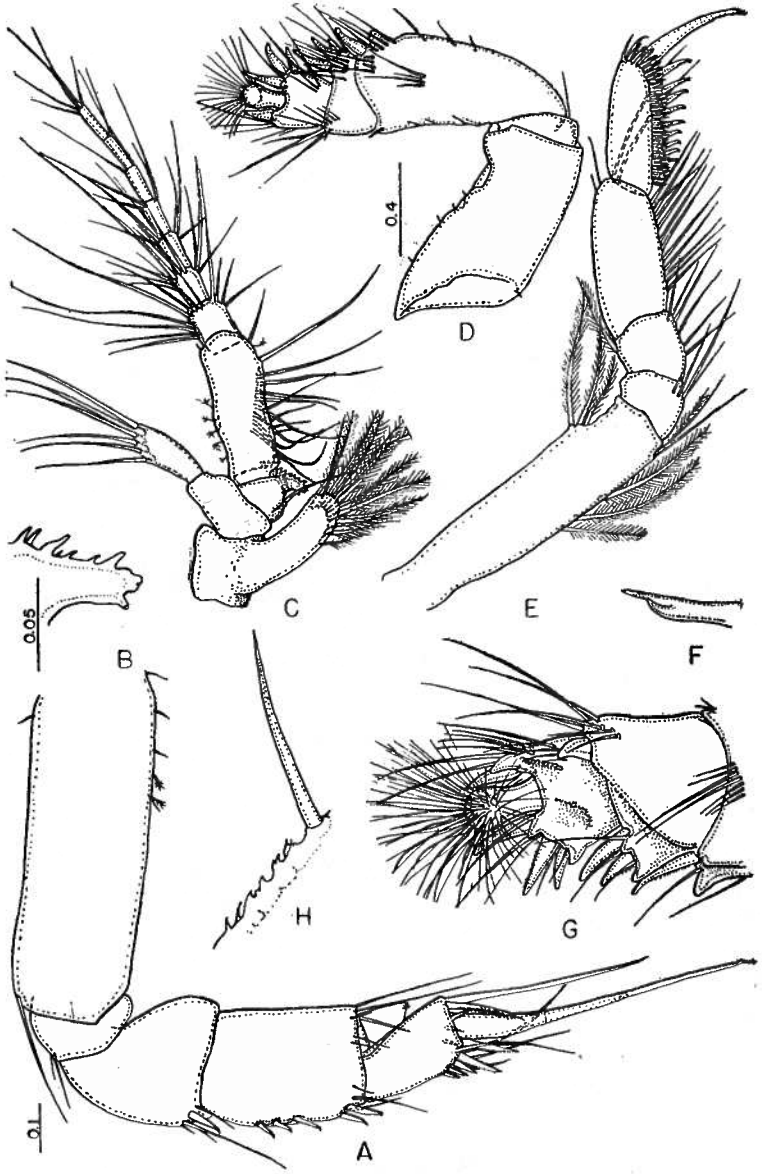

Fig. 18. *Kalliapseudes crassus*, n. sp., female, paratype, A. third peraeopod, B. superior margin of third article of second antenna, C. second antenna, D. second peraeopod, E. seventh peraeopod, F. apex of dactyl of seventh peraeopod, G. distal articles of second peraeopod, H. spinulate edge of peduncle of first antenna. Figures with similar magnification, A, C, E, G; B, F, H; D.

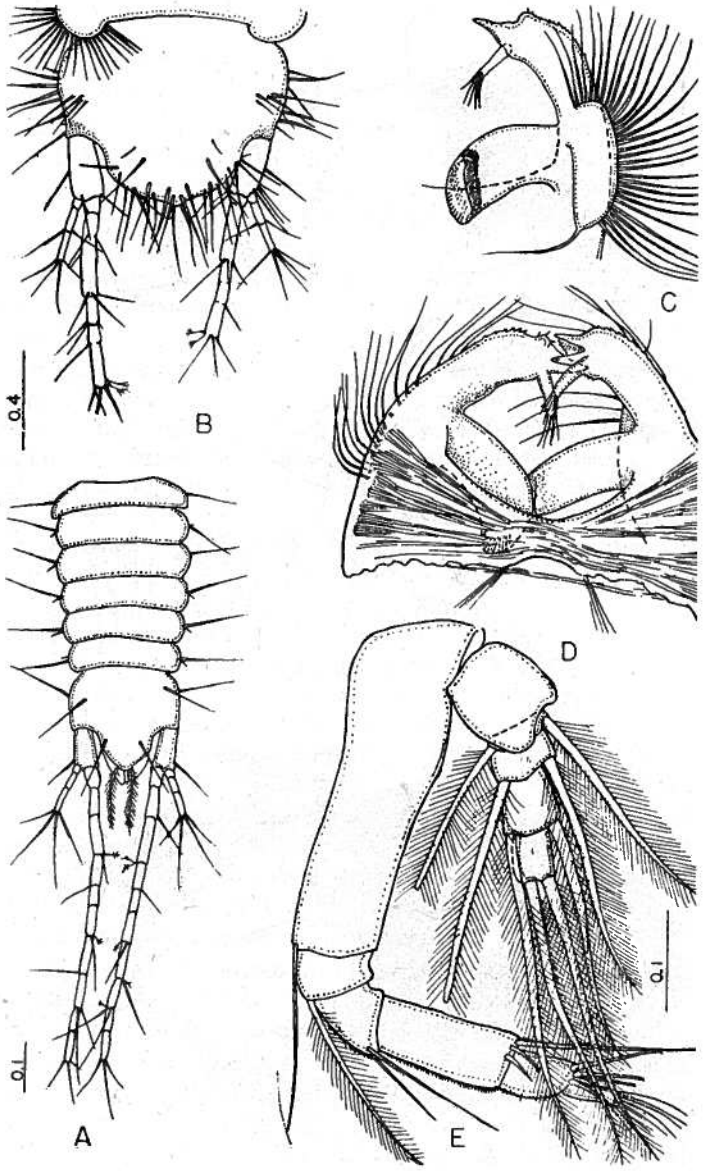

Fig. 19. *Kalliapseudes crassus*, n. sp., paratype. A. last peraeonal s pleon and uropods of juvenile removed from marsupial pouch, B. adult t C. palpar surface of right mandible, D. mandibles showing how the fused together on midline, E. fifth peraeopod with exopod, of juvenile re from marsupial pouch. Figures with similar magnification, A, C, D; B

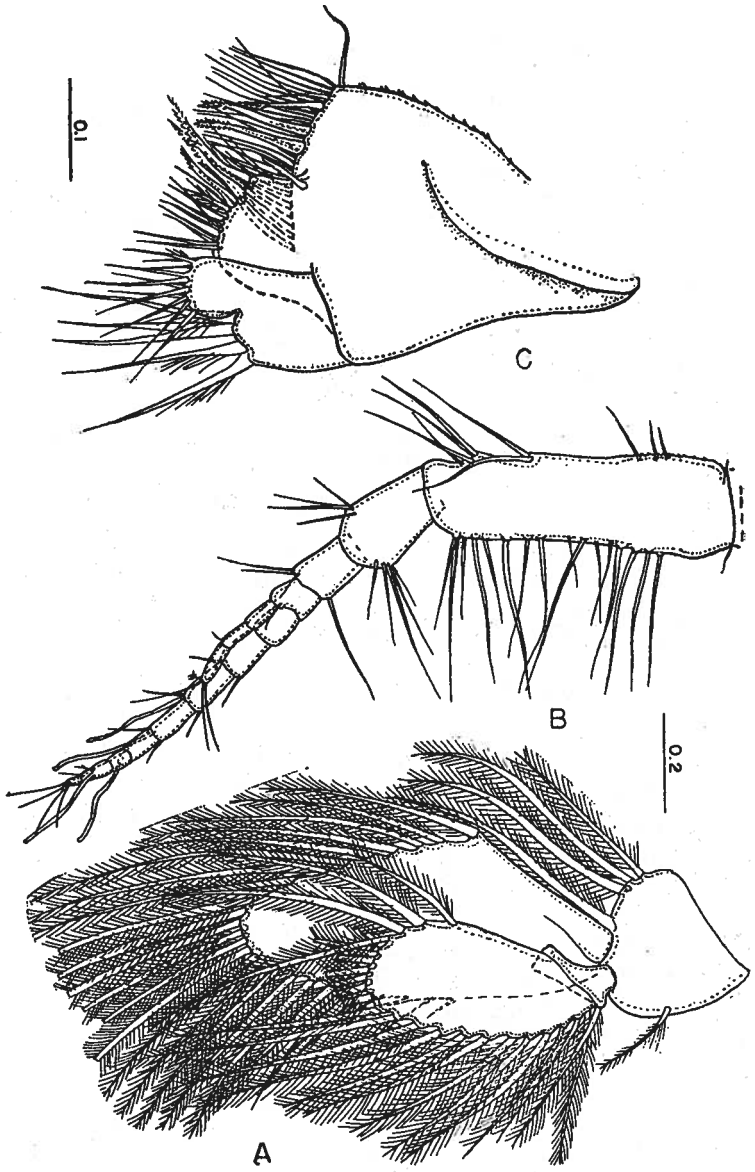

Fig. 20. *Kalliapseudes crassus*, n. sp., female paratype, A. first pleopod, B. first antenna, C. second maxilla. A–B with similar magnification.

Specimens examined. Types only.

Geographic range. Known only from the type locality.

Remarks. I concur with Lang (1949, p. 3) that "die La Nierstrasz (1913, pl. II) is the molar process. The mandibles a as other writers have figured them, at least in this species. Bo right and left mandibles are united by a sclerotized band nea bases. The setal row is similar to what Stebbing (1910) descri *K. makrothrix*, being located at the apex of an elongated, t projection of the mandibles. The lacinia is present only on t mandible.

Of particlar interest in this species are the changes which the exhibit in metamorphosis. The young which have recently er from the marsupium are markedly different from the adults. T no doubt that they belong to the same species because th identical in all respects with specimens removed from the marsı In contrast to the adult they have no pleopods and very few are present on the lateral margins of the somites of the pleon. Ir tion they possess a structure not found on adults, namely, th and sixth peraeopods have relatively large pentarticulate "ex attached to the proximal end of the elongate basis. As the anim larger, the endopod of the uropod increases in number of article ten to about eighteen, but the number of articles comprisi exopod remains at three. The outer branch of the first antenn four articles during the metamorphosis while the inner branc but two.

The arrangement of double rows of plumose setae on the arti the gnathopod, maxilliped, and mandibular palp suggest *Kalliapseudes* is a filter-feeder. A similar situation prevails other species of the genus. The specimens reported here were from a mud-sand substrate among sponges.

This species differs from the others belonging to the genus in faintly separated eyelobes which bear facets. It differs from *K. frons* in having the apex of the telson somewhat pointed and no

The eyes of *K. crassus* are on lobes but the lobes, as in the fol species, do not appear to be entirely separated from the cephe they are in *Parapseudes*, for example, and only a faint line in their demarkation from the cephalon. No epipods were obser be attached to the gnathopod and second peraeopod of this sp

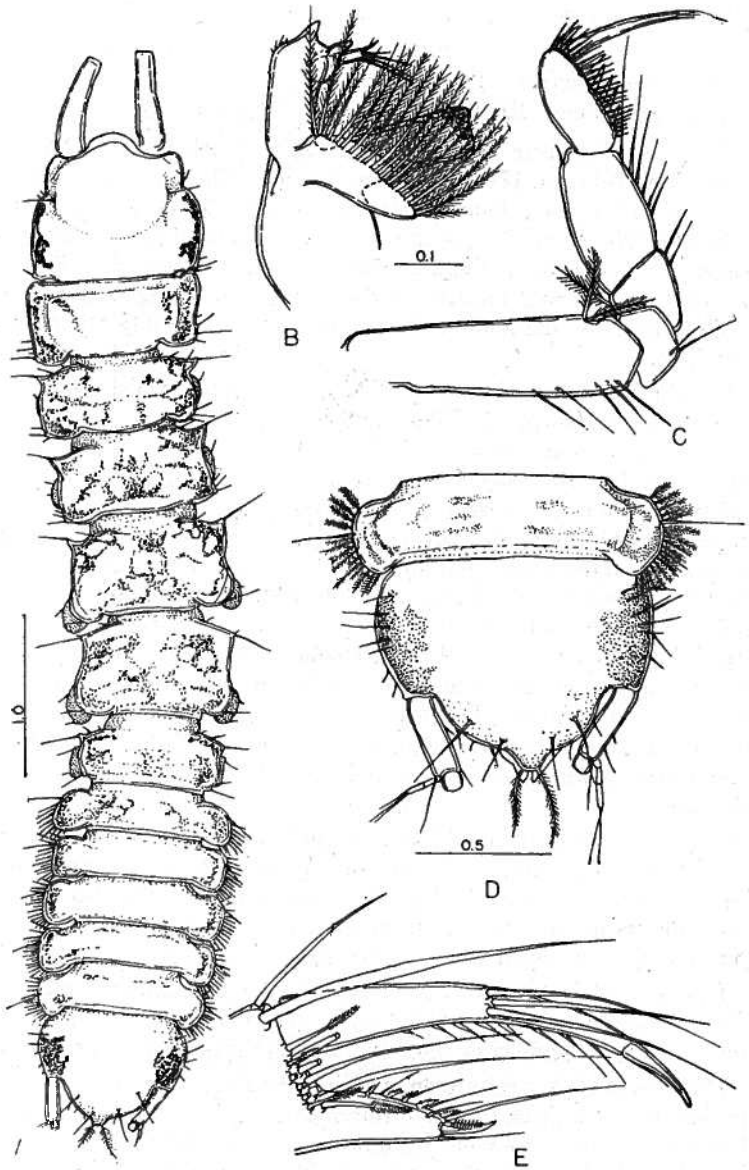

Fig. 21. *Kalliapseudes viridis*, n. sp., female paratype, A. toto, B. left mandible, C. seventh peraeopod, D. telson and fifth somite of pleon, E. female gnathopod. Figures with similar magnification, A; B, C, E; D.

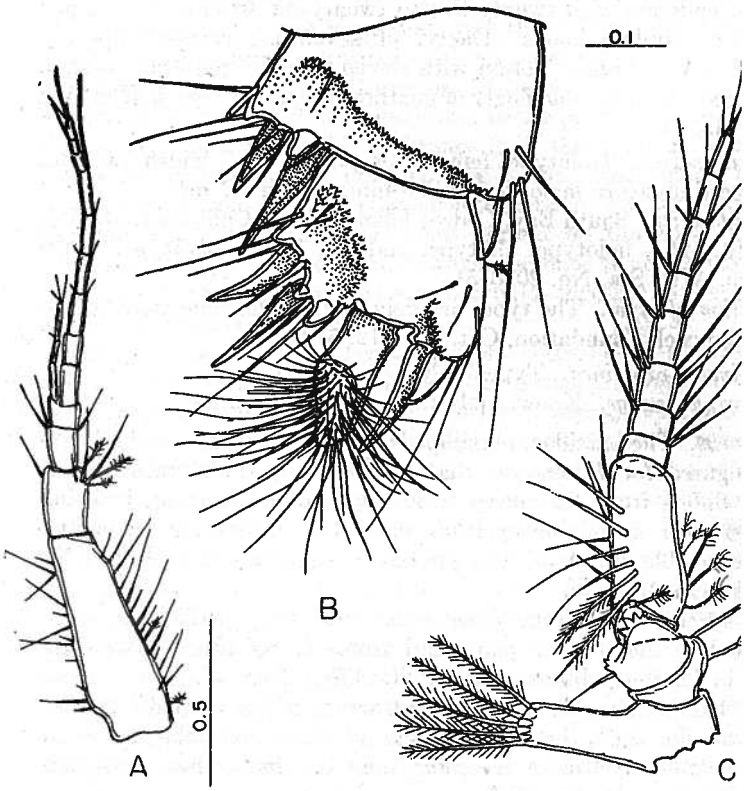

Fig. 22. *Kalliapseudes viridis*, n. sp., A. first antenna, B. apical second peraeopod, C. second antenna. Figures with similar magni A; B, C.

KALLIAPSEUDES VIRIDIS new species

Figures 21–22

Diagnosis. Eyelobes present, facets lacking. Outer branch antenna with nine articles, inner with three. Second antenn twelve articles. Mandibular palp uniarticulate, united along its inner margin with the mandible. Exopod of uropod wit

articles, endopod with twenty-five to twenty-six articles. Maxilliped with two coupling hooks. Dactyl of seventh peraeopod apically bifid. Rostrum blunt. Telson with eleven setae on posterior margin. Color green. Immovable finger of gnathopod less than one half as long as dactyl.

Measurements. Holotype, female, length 7.2 mm., width 1.0 mm. Allotype (immature male) length 5.0 mm., width 0.7 mm.

Type locality. South Bay, Cedros Island, Lower California, Mexico, April 19, 1951, holotype, allotype, and one female paratype, 16–19 fathoms, AHF Sta. No. 2026–51.

Location of types. The types are deposited in the collections of the Allan Hancock Foundation, Cat. No. 512, 512a.

Specimens examined. Types only.

Geographic range. Known only from the type locality.

Remarks. The maxillae, maxillipeds, and pleopods are so similar to those figured for *K. crassus* that they were not illustrated. This species differs from *K. crassus* in having a blunt rostrum, in being green in color, in having eyelobes which lack facets, and in having the immovable finger of the gnathopod exceptionally short. No epipods were observed.

This species differs from *K. makrothrix* Stebbing (1910) in having a uniarticulate mandibular palp, and from *A. primitivus* Nierstrasz (1913) in having a blunt rostrum. It differs from *K. mauritanicus* Monod(1923) in having only the first article of the uropodal exopod short and not both the first and second short and subequal as in *K. mauritanicus*. Unlike *K. obtusifrons* the telson has a median posterior lobe and is not bifid.

Genus IMITAPSEUDES new genus

Type species. Imitapseudes glebosus n. sp.

Diagnosis. Pleon consisting of six somites including the telson. Adult with five pairs of pleopods. Gnathopod and second peraeopod without an epipod. Second antenna with a scale. Mandibular palp triarticulate. Dactyl of second peraeopod with a simple, pointed apex. First somite of pleon much narrower than other somites, lacking the lateral expansions which characterize the other pleonal somites. Telson with a "pseudosegment" on lateral margin near anterior end.

Here a structure similar to the lateral expansions characteristic last five pleonal somites is present, but there is no separatio somite. Facet bearing separated eyelobes present.

Remarks. This genus differs from *Apseudes*, which it res considerably, in the lack of epipods and in the peculiar morpho the pleon. Another possible difference is in the presence of ridges and grooves on the inner surface of the carpal article mature male gnathopod. This structure bears an interesti semblance to the stridulating ridges present on the append other crustaceans. It functions, however, perhaps to act as a c apparatus holding the apposed carpal articles together rather t act as a noise-making device.

Imitapseudes is close to *Apseudomorpha* Miller (1940, p. 315) species are known to belong to the latter genus, *A. oahuensis* the type species, and *A. avicularia* (Barnard) (Lang, 1949, p. 5 possible that *Apseudes hirsutus* Stebbing should also be refe *Apseudomorpha*. Lang (in letter) has discovered that the pedu the uropods of *Apseudomorpha* consists of only one article a makes the similarity between the two more striking. The st of the telson of *A. avicularia* is similar to that of several spe *Imitapseudes*. The pleonal structure is, however, markedly di all somites except the fifth of *A. avicularia* being similar t *tapseudes*. The reverse is true in *A. oahuensis*, where the p similar to *Imitapseudes* but where the telson is very different. one good characteristic separates the two genera, in *Apseudo* only one pair of pleopods occur, whereas, in *Imitapseudes* th five pairs. Separated eyelobes were neither mentioned nor figu the two species of *Apseudomorpha* but their existence should ruled out until the specimens are re-examined (Lang, 1949, p.

It is possible that *Apseudes timaruvia* Chilton (1882, p. 148) belong to either *Apseudomorpha* or *Imitapseudes*. The speci however, have to be redescribed before a positive generic assi can be made, as its characteristics are too imperfectly known. S (1951) *Metapseudes albidus* no doubt belongs in *Imitapseud* Addendum).

Key to the Species of Imitapseudes

A. First article of uropodal exopod one-half the length of second.
   B. Exopod of pleopod (both sexes) with two articles.....
   .....*magdalenens*

B¹. Exopod present on pleopod of male only. This has one article..... ..... *veleronis* n. sp.

A¹. First article of uropodal exopod two times the length of second..... ..... *glebosus* n. sp.

IMITAPSEUDES GLEBOSUS new species

Figures 23–24

Diagnosis. Peduncle of first antenna with three articles; first with two large spines on upper edge of inner surface. Second antenna with seven to eight articles. Exopod of uropod with three articles; first article two times the length of the second; second as long as third. Pleopods of both sexes similar, consisting of an elongate peduncle with two uniarticulate branches.

Measurements. Mature male holotype, length 1.9 mm., width 0.32 mm. Allotype, ovigerous female, length 1.8 mm., width 0.4 mm.

Type locality. Melpomene Cove, Guadalupe Island, Mexico, December 17, 1949, holotype, allotype, and 161 paratypes, intertidal zone, under rocks and on algae, AHF Sta. No. 1912–49.

Location of types. The types are deposited in the collections of the Allan Hancock Foundation, Cat. No. 4912, 4912a.

Material examined (exclusive of types). CALIFORNIA. *Santa Barbara Island,* four mi. E. of landing, August 28, 1941, 1 ovigerous female, 40 fms., sand, AHF Sta. No. 1398–41. *Santa Catalina Island,* Farnsworth Bank, September 7, 1949, 1 male, 8 fms., AHF Sta. No. 1903–49.

MEXICO. Lower California, west coast. Six mi. SW of *San Carlos Point,* April 25, 1950, 1 ovig. female, 20 fms., rock, AHF Sta. No. 1944–50 Guadalupe Island, *Melpomene Cove,* December 1949, 52 specimens, AHF Sta. No. 1915–49 and 1923–49, with *Synapseudes rudis* and *Synapseudes intumescens.*

ECUADOR. *La Plata Island,* February 10, 1934, 2 females, 7–10 fms., AHF Sta. No. 213–34.

Geographic range. Channel Islands, California to Ecuador.

Remarks. The number of articles comprising the branches of the uropods was constant. In contrast, the number of articles comprising the branches of the flagellum of the first antenna increased as the size of the animal increased (Figure 24E-G). The elongate first article of the uropod distinguishes this species from *I. magdalenensis* and *I. veleronis.*

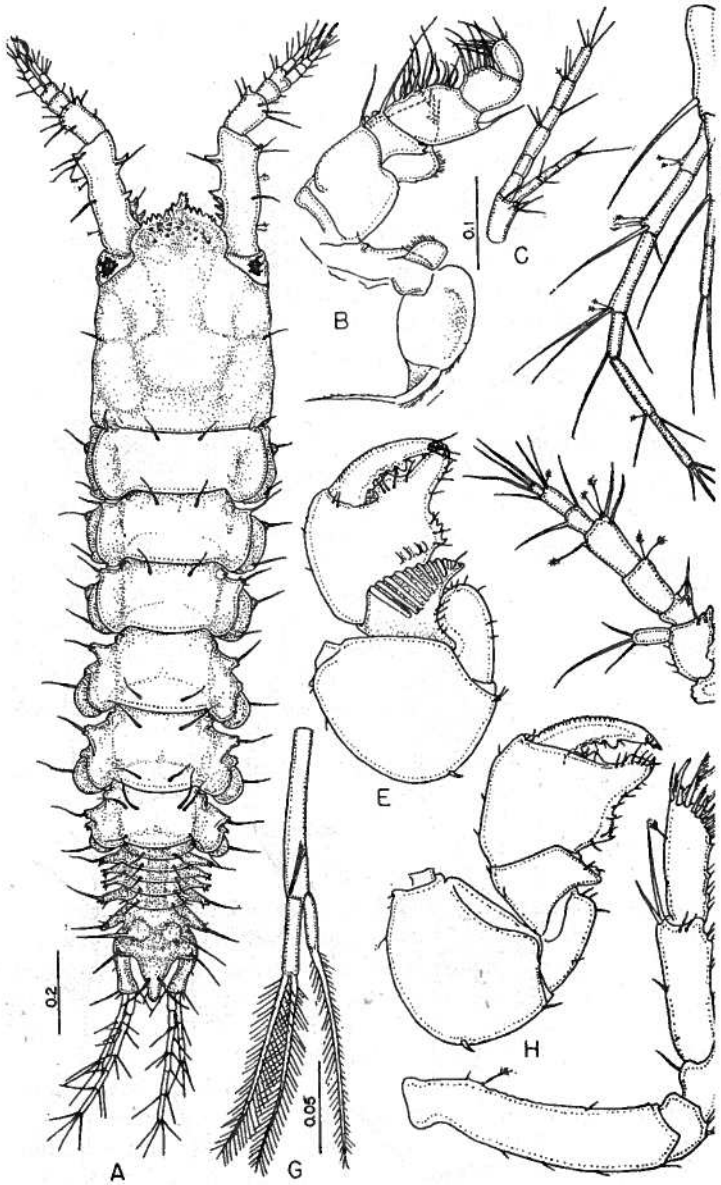

Fig. 23. *Imitapseudes glebosus,* n. sp., paratype, A. toto, B. ma C. uropod, D. uropod, E. inner surface of male gnathopod, F. sec tenna, G. first pleopod, H. outer surface of male gnathopod, I. peraeopod. Figures with similar magnification, A, E, H; B, C, D, F

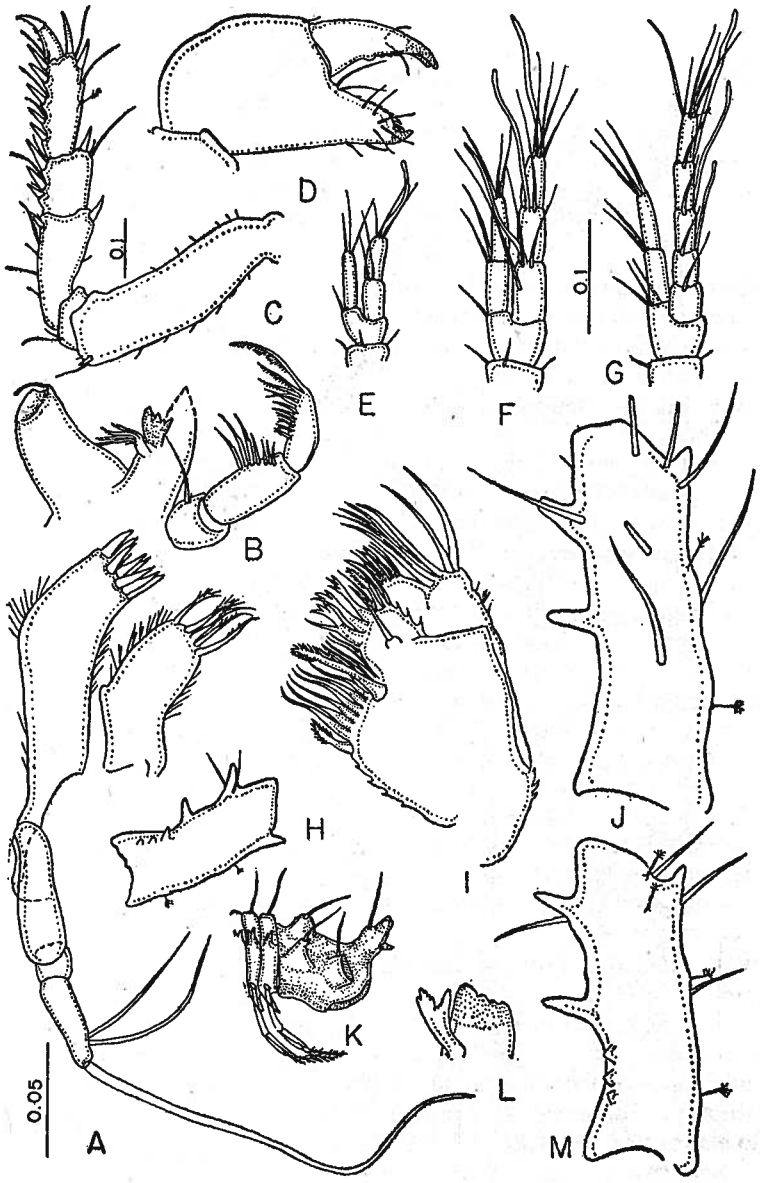

Fig. 24. *Imitapseudes glebosus*, n. sp., paratype, A. first maxilla, B. left mandible, C. second peraeopod, D. gnathopod of female, E–G. flagellar articles of first antenna, H, J, M. first peduncular article of first antenna, I. second maxilla, K. lateral view of telson, L. incisor and lacinioid seta of right mandible. Figures with similar magnification, A, B, I, L; C, K; D, E, F, G, H, J, M.

IMITAPSEUDES MAGDALENENSIS new species

Figure 25A–E

Diagnosis. Peduncle of first antenna with three articles; first with four to five large spines on the upper edge of the inner su Second antenna with seven to eight articles. Exopod of uropoc three articles; first article one half the length of second; second s than third. Pleopods of both sexes similar, consisting of an elc peduncle having a biarticulate exopod and an uniarticulate end

Measurements. Mature male holotype, length, 2.0 mm., wid mm. Ovigerous allotype, length 2.0 mm., width 0.4 mm.

Type locality. Entrada Point, Magdalena Bay, Lower Cali Mexico, May 2, 1950, holotype, allotype, and over 90 para intertidal, AHF Sta. No. 1961–50.

Location of types. The types are deposited in the collections Allan Hancock Foundation, Cat. No. 507, 507a.

Material examined (exclusive of types). MEXICO, Lower fornia, west coast, E. of *San Benito Island*, April 26, 1950, 12 mens, shore, AHF Sta. No. 1946–50. W. side of middle *San Island*, May 8, 1950, 1 ovig. female, shore, AHF Sta. No. 1976-

Geographic range. West coast of Lower California, Mexico, San Benito Island to Magdalena Bay.

Remarks. This species is closely related to *I. veleronis*, from w differs only in the structure of the pleopods.

IMITAPSEUDES VELERONIS new species

Figure 25F–G

Diagnosis. This species resembles *I. magdalenensis* so closel the diagnosis for the latter applies to *I. veleronis* almost exactly two species differ, however, in one significant and consistent r The pleopods of the female of *I. veleronis* have only one b whereas those of the male have two very short uniarticulate bra

Measurements. Male holotype, length 1.5 mm., width 0.2 No allotype selected.

Type locality. Octavia Bay, Colombia, January 28, 1935, ho male, 1 female paratype, shallow water, coral, AHF Sta. No. 4

Location of type. The types are deposited in the collections U. S. National Museum, Washington, D. C.

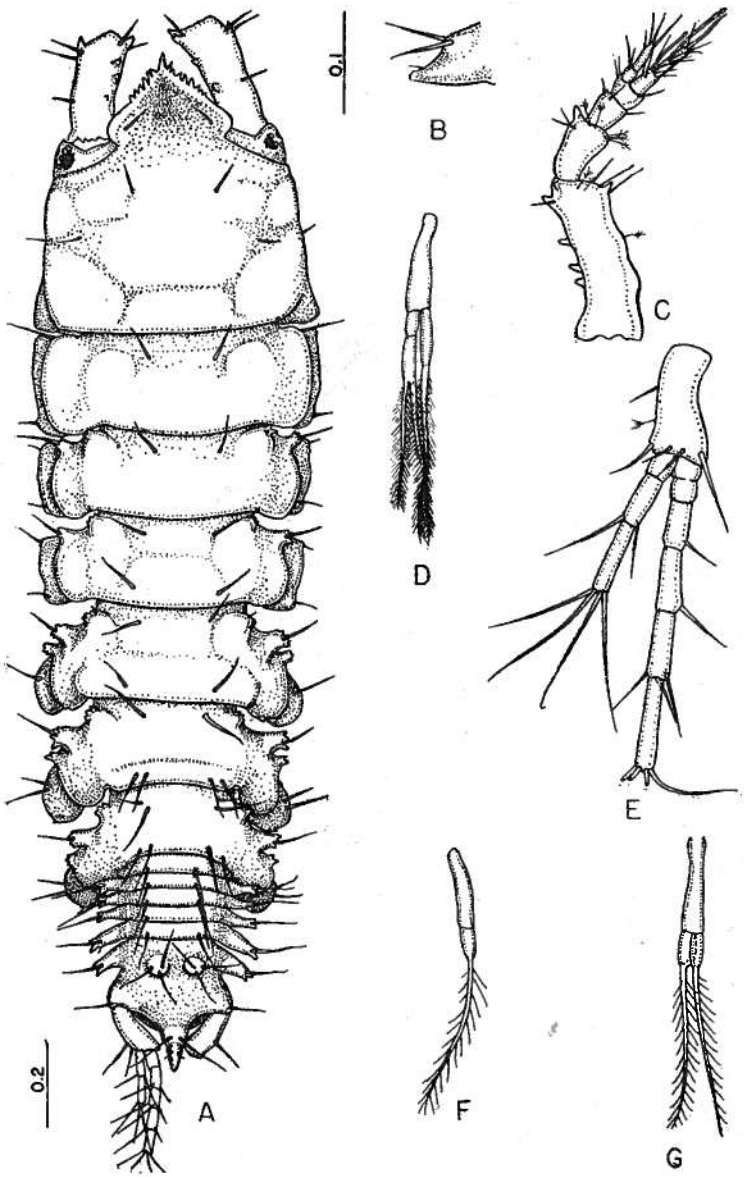

Fig. 25. *Imitapseudes magdalenensis*, n. sp., paratype, A. toto, B. lateral view of telson, C. first antenna, D. first pleopod, E. uropod. *Imitapseudes veleronis*, n. sp., paratype, F. male first pleopod, G. female first pleopod. Figures with similar magnification, A, C; B, D, E, F, G.

Material examined (exclusive of types). PANAMA. *Piñas* January 29, 1935, 1 ovig. female, 2–4 fms., coral, AHF Sta. No. 44

COLOMBIA. *Gorgona Island*, January 22, 1935, 1 ovig. fe shallow water, coral, AHF Sta. No. 411–35.

GALAPAGOS ISLANDS. *Charles Island*, January 17, 19 male, 3 fms., low tide, AHF Sta. No. 161–34.

Geographic range. Panama to Colombia, and the Gala Islands.

Remarks. Were it not for the fact that the pleopods of this s are so constant in their morphology, I would certainly have cons this species identical with *I. magdalenensis*. Until intergradatio found it is apparent that the two should be considered distinct sp

Genus CYCLOPOAPSEUDES new genus

Type species. *Cyclopoapseudes indecorus* new species.

Diagnosis. Pleon consisting of six somites including telson. with five pairs of pleopods. Gnathopod and second peraeopod out an epipod. Second antenna with a scale. Mandibular pa articulate. Dactyl of second peraeopod with a simple, pointed Somites of pleon all of similar width. Facet bearing separate lobes present.

Remarks. The lack of epipods and the peculiar *Cyclops*-like of the animal are the only apparent features separating this from *Apseudes*. These characteristics, of course, need not generic importance, but considering the facts that *Apseudo* separated from *Apseudes* only because its ocular lobes are com fused with the cephalon, and that *Parapseudes* is separated fro *seudes* in having one less pair of pleopods, it would seem desira keep *Cyclopoapseudes* separate from *Apseudes* also.

To my knowledge no other species of apseudid has been des to date which can be placed with certainty in *Cyclopoapseudes*.

CYCLOPOAPSEUDES INDECORUS new species

Figures 26–27

Diagnosis. Eyes laterally located. Peduncle of first antenn three articles; first exceeds two-times the length of second, third one half as long as second. Inner branch of flagellum of first a

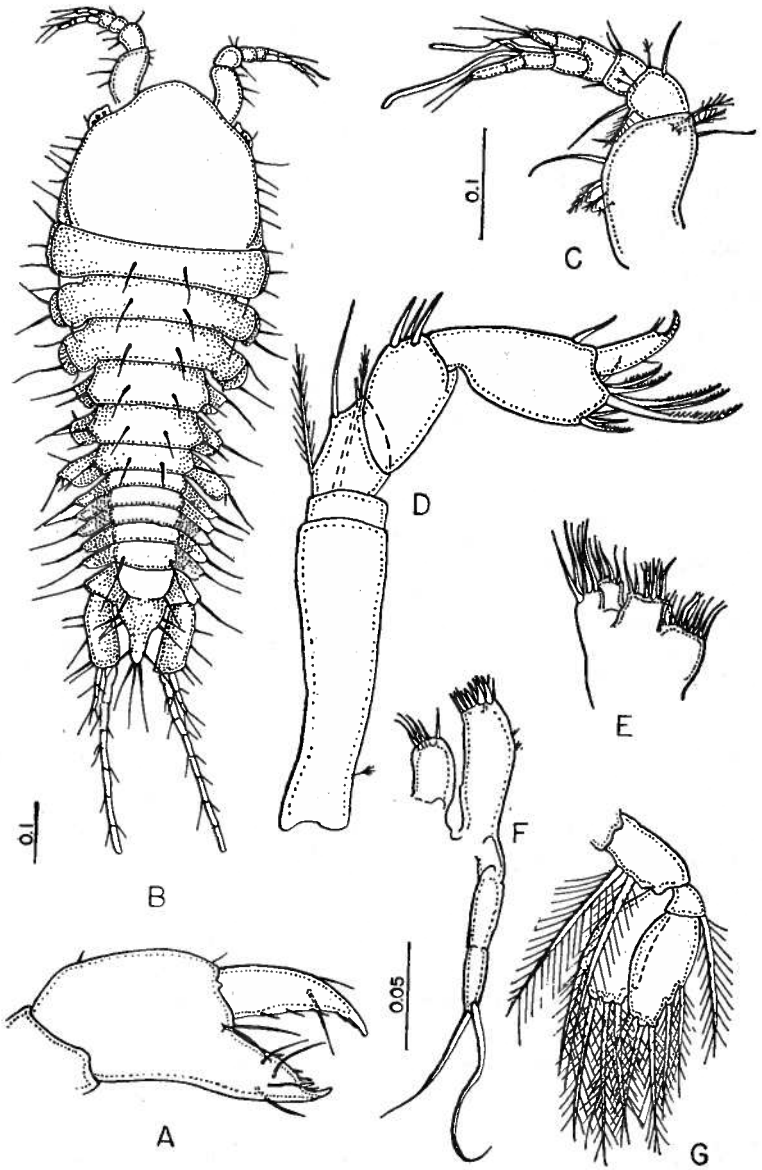

Fig. 26. *Cyclopoapseudes indecorus*, n. sp., holotype, A. gnathopod, B. toto, C. first antenna, D. fourth peraeopod, E. second maxilla, F. first maxilla, G. first pleopod. Figures with similar magnification, A, D, E, F, G; B; C.

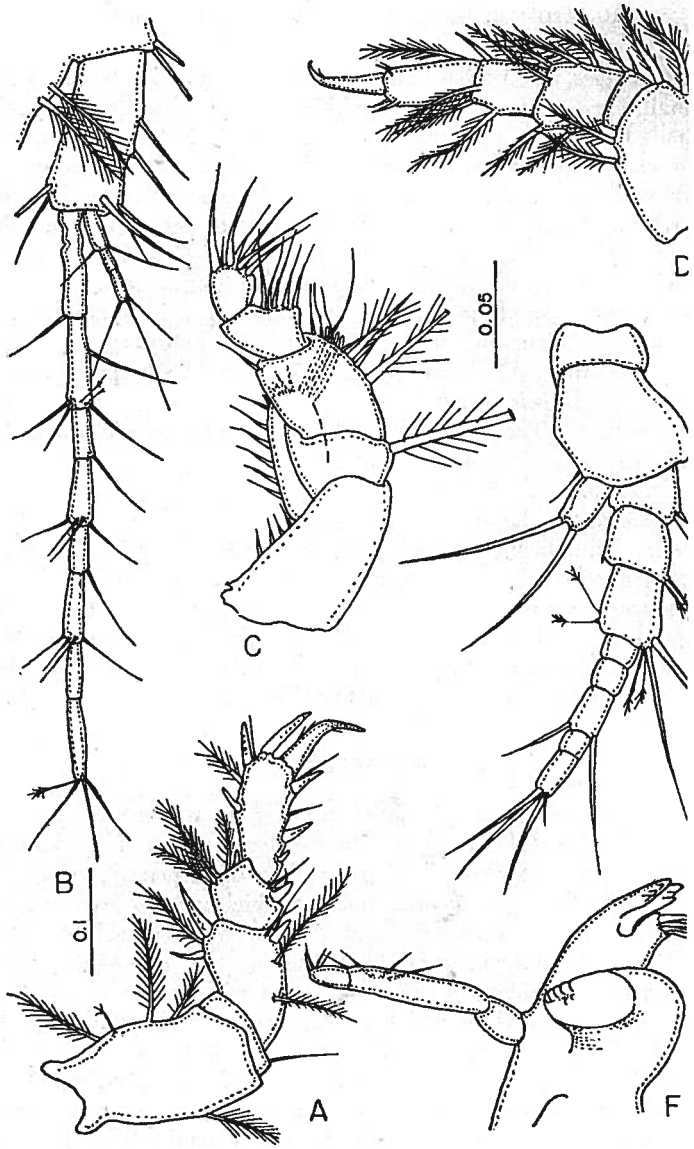

Fig. 27. *Cyclopoapseudes indecorus*, n. sp., holotype, A. second pe B. uropod, C. maxilliped, D. seventh peraeopod, E. second antenna mandible. Figures with similar magnification, A, B, D; C, E, F.

with two articles, outer with four. Second antenna with ten articles, scale small. Peraeonal and pleonal somites of similar length. Peduncle of uropods long, exceeding one-half the length of the telson; exopod with three articles, endopod with eight articles. Outer branch of pleopods with two articles. Third article of mandibular palp about one-fourth the length of the second and equal to the first in length. Incisor of right mandible with five teeth, that of left with four teeth, lacinia with at least three teeth, setal row with four setae.

Measurements. Holotype male, length 0.90 mm., width 0.35 mm.

Type locality. Ecuador, off La Plata Island, February 10, 1934, holotype, 7–10 fms., AHF Sta. No. 213–34, found with specimens of *Parapseudes pedispinis* (Boone).

Location of type. The type is deposited in the collections of the U. S. National Museum, Washington, D. C.

Material examined. Type only.

Geographic range. Known from type only.

Remarks. The abrupt narrowing of the fourth and fifth somites of the peraeon as shown in the figure may represent an aberrant condition. When the somites are spread out they are about equal in width to the other somites of the peraeon. The fourth pair of peraeopods seems excessively long and peculiar in structure in comparison with the fourth pair of peraeopods of other apseudids.

ADDENDUM

After the appearance of this paper in proof the writer received Dr. Sueo M. Shiino's excellent paper "On two new species of the family Apseudidae found at Seto." There Shiino described *Synapseudes setoensis* and *Metapseudes albidus*, both of which were collected from the intertidal zone on the rocky coast of Seto, Wakayama Prefecture Japan. *Synapseudes setoensis* is clearly related to *Synapseudes rudis* and *S. hancocki* in having a second antenna with six articles and a uropodal exopod with three articles. The mature male gnathopod of *S. setoensis*, like that of *S. hancocki* and unlike that of *S. rudis* lacks an apical claw on each finger. The dactyl of that gnathopod of *S. setoensis* has at least five marginal teeth on the cutting edge; whereas, that of *S. hancocki* has only three such teeth. The cheliped of less mature males of *S. hancocki* is markedly different from the cheliped of similarly developed *S. setoensis* in having teeth on the

inferior margin of the dactyl; to judge from Shiino's figures "sub-
specimens of *S. setoensis* lack teeth on the inferior margin of the
of the cheliped.

Shiino's excellent descriptions and figures are so complete tha
is no doubt that his *Metapseudes albidus* belongs to my new
Imitapseudes. *Imitapseudes albidus* (Shiino), as I shall here r
that species, seems closely related to *I. magdalenensis* and *I. ve*
From these it differs (again to judge from Shiino's figures) in
the first two articles of the uropodal exopod subequal in leng
I. magdalenensis and *I. veleronis* the first article of the uropodal
is markedly shorter than the second. The endopod of the urc
I. albidus has further about two more articles than are fo
I. magdalenensis and *I. veleronis*. Like *I. veleronis* and unlike *I.*
lenensis, the pleopods of *I. albidus* have uniarticulate rami. *I. c*
however, further differs from *I. veleronis* in that the female
biramous and not uniramous pleopoda. In summary, ther
several specific differences between the species described here
those described by Shiino from Japan.

I can not concur with Shiino that *Metapseudes aukland*
I. albidus belong to the same genus. The mere absence fro
tapseudes of the antennular scale, of the pseudosegment on t
otelson, and of the broad rostral plate seem to be pronounced
ences of generic importance. *Apseudes*, *Apseudopsis*, and *Paraj*
three genera recognized as valid by most writers, seem obviousl
nearly related to one another than *Metapseudes* is to *Imitaj*
As previously pointed out, *Apseudes* differs from *Apseudopsis*
that the eyelobes are separated from the cephalon in the form
are fused with the cephalon in the latter. *Parapseudes* differ
Apseudes primarily in having one less pair of pleopods. As l
those genera continue to be recognized as distinct on such cha
istics one must also consider *Imitapseudes* similarly valid.

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