

1-1-1987


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## NSUWorks Citation

J. L. Barnard and James Darwin Thomas. 1987. A New Species of Chevalia from the Caribbean Sea (Crustacea: Amphipoda). *Proceedings of the Biological Society of Washington*, (3) : 532 -542. [https://nsuworks.nova.edu/occ\\_facarticles/601](https://nsuworks.nova.edu/occ_facarticles/601).

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## A NEW SPECIES OF *CHEVALIA* FROM THE CARIBBEAN SEA (CRUSTACEA: AMPHIPODA)

J. L. Barnard and J. D. Thomas

*Abstract.*—A new Caribbean species, *Chevalia carpenteri* is described; heretofore only one species of the genus was known, but we have examined material that suggests morphs may represent distinct species or subspecies. We report *C. mexicana* and extend its range from the northern Gulf of Mexico to Belize. Our new species differs from the world complex of *C. aviculae* morphs in the ovate article 2 of pereopods 5-7 and the posteriorly flat epimera with large notches.

*Chevalia* has heretofore been monotypic, the type species being *C. aviculae* Walker (1904) from Ceylon. Two other species, *Chevalia mexicana* Pearse (1913) from the Gulf of Mexico and *Neophotis inaequalis* Stout (1913) from California were synonymized with *C. aviculae* by Shoemaker (1942) and J. L. Barnard (1962, 1970). *Chevalia mexicana* is redescribed from specimens collected at Belize and reexamination of type material in Smithsonian Institution. A strongly distinct new species from the Florida Keys and Belize is described and some previous materials reported as *C. aviculae* from California, Hawaii, and the Galapagos Islands, are reviewed. This new study suggests that *C. aviculae* has minutely distinct populations in those places but the type material from Ceylon remains obscure and an elaboration of possible species of subspecies around the tropics is not possible. A new diagnosis of the genus and a key to these taxa is presented below.

### Methods

Two diagnoses each are given for *Chevalia mexicana* and *C. carpenteri* to compare each with the superspecies complex of *C. aviculae* and with the (presumably specific) divisions of *C. aviculae* not yet possible to implement.

### Legend

Capital letters as follows refer to parts; lower case letters to the left of capital letters refer to specimens noted in legends; lower case letters to right of capitals refer to adjective modifications in list: B, body; C, coxa; D, dactyl; F, accessory flagellum; G, gnathopod; I, inner plate or ramus; L, labium; M, mandible; O, outer plate or ramus; P, pereopod; Q, pleopod; R, uropod; S, maxilliped; T, telson; U, labrum; W, urosome; X, maxilla; Y, gill; Z, oostegite; l, left; r, right.

### *Chevalia* Walker

*Chevalia* Walker, 1904:288 (*Chevalia aviculae* Walker, 1904, monotypy).—J. L. Barnard, 1969:271.

*Neophotis* Stout, 1913:652 (*Neophotis inaequalis* Stout, 1913, monotypy).

*Diagnosis.*—Corophiidean with fleshy telson; article 2 of antenna 1 longer than article 1, article 3 shorter than 1, accessory flagellum 2-3 articulate; antenna 2 slightly shorter than antenna 1; labrum weakly excavate below; incisors and laciniae mobiles serrate, rakers about 4, palp article 3 slightly shorter than 2, thinly clavate, with ABDE setae; inner lobes of labium large and fleshy; inner plate of maxilla 1 present but small and poorly armed, outer plate with 10-11

spines, palp 2-articulate, article 1 short; inner plate of maxilla 2 with oblique facial row of setae; plates of maxilliped thin, outer with sparse but large medial spines, palp thin, dactyl stubby, multi-armed; coxae small, disjunct, coxae 1-2 larger than 3-7; gnathopods of sexes alike, gnathopod 1 feeble, almost simple, carpus elongate; gnathopod 2 large, carpus short and lobate, propodus large, subrectangular, palm weakly oblique or transverse, defined by tooth, dactyl thick; locking spines of pereopods 6-7 comprised of one short thick spine and one elongate thin seta, often on pereopod 5 both thin and short, on pereopods 3-4 both long and seta-like; dactyls of pereopods 3-4 simple, of pereopods 5-7 strongly bent and with large outer tooth; pereopods 5-7 short but increasingly elongate, feeble; oostegites absent on coxa 2 (and occasionally coxa 3), thin, strap-shaped, sparsely setose; branchiae thin, on coxae 2-6; epimera simple; urosomites 1-2 fused, urosomite 3 free; outer rami of uropods 1-2 shortened, armed apically, inner rami styliform and unarmed apically; uropod 3 short, rami subequal, thin, setose only apically; telson short, as broad as long, squared, well setose dorsally.

Key to the Taxa of *Chevalia*

- 1. Article 2 of pereopods 5-7 ovate, not produced posteroventrally, epimera 1-3 straight behind, with distinctly strong posteroventral notch, coxal gill 2 shortened, oostegites 2 pairs ..... *carpenteri*
- Article 2 of pereopod 7 subquadrate, produced or squared posteroventrally, epimera 1-3 convex behind, with weak notch or none, coxal gill 2 not shortened, oostegites 3 pairs ..... *aviculae* complex ..... 2
- 2. Palm of gnathopod 2 transverse .. 3
- Palm of gnathopod 2 oblique .... 4
- 3. Palm of gnathopod 2 with deep sinus near dactylar hinge, article 2 of pereopod 7 obtusely lobate, anten-

- nae and mandibular palp ordinary ..... HAWAII
- Palm of gnathopod 2 lacking sinus, article 2 of pereopod 7 quadrate, antennae and mandibular palp immense .....(MADAGASCAR, WEST ATLANTIC) *mexicana*
- 4. Coxa 1 with sharply attenuate anteroventral apex ..... (CEYLON, type) *aviculae*
- Coxa 1 blunt and not attenuate apicoventrally ..... 5
- 5. Article 2 of pereopod 7 with protuberant posteroventral lobe, hinge notch of palm deep ..... GALAPAGOS + FIJI
- Article 2 of pereopod 7 quadrate, hinge notch of palm weak ..... (CALIFORNIA) *inaequalis*

*Chevalia aviculae* Walker, Superspecies

*Diagnosis.* — Article 3 of antenna 1 about 0.70-0.75 times as long as article 1; accessory flagellum 2-3 articulate, article 1 short or long (2-articulate and article 1 long in California, Galapagos, Hawaii, but 3-articulate with article 1 short in western Atlantic = *mexicana*). Coxal gill 2 almost as long as other gills. Three pairs of oostegites present (on coxae 3-5). Article 2 of pereopods 5-7 pyriform, with extended or produced posteroventral corner (especially on pereopod 7); article 5 of pereopods 5-7 with 1 (rarely 2) main emergent spine(s); article 4 of pereopod 7 slender (type and Galapagos) or broad in California-Hawaii. Epimer 1-3 with convex posterior margin, posteroventral notch tiny or absent. Apex of outer ramus on uropod 2 with 5-6 subsidiary spines, some of these directly basal to 3 main distal spines.

*Chevalia aviculae* Walker

*Chevalia aviculae* Walker, 1904:288-290, pl. 7, fig. 50, pl. 8, fig. 50; 1909:341. — K. H. Barnard, 1916:252; 1937:169, fig. 15.

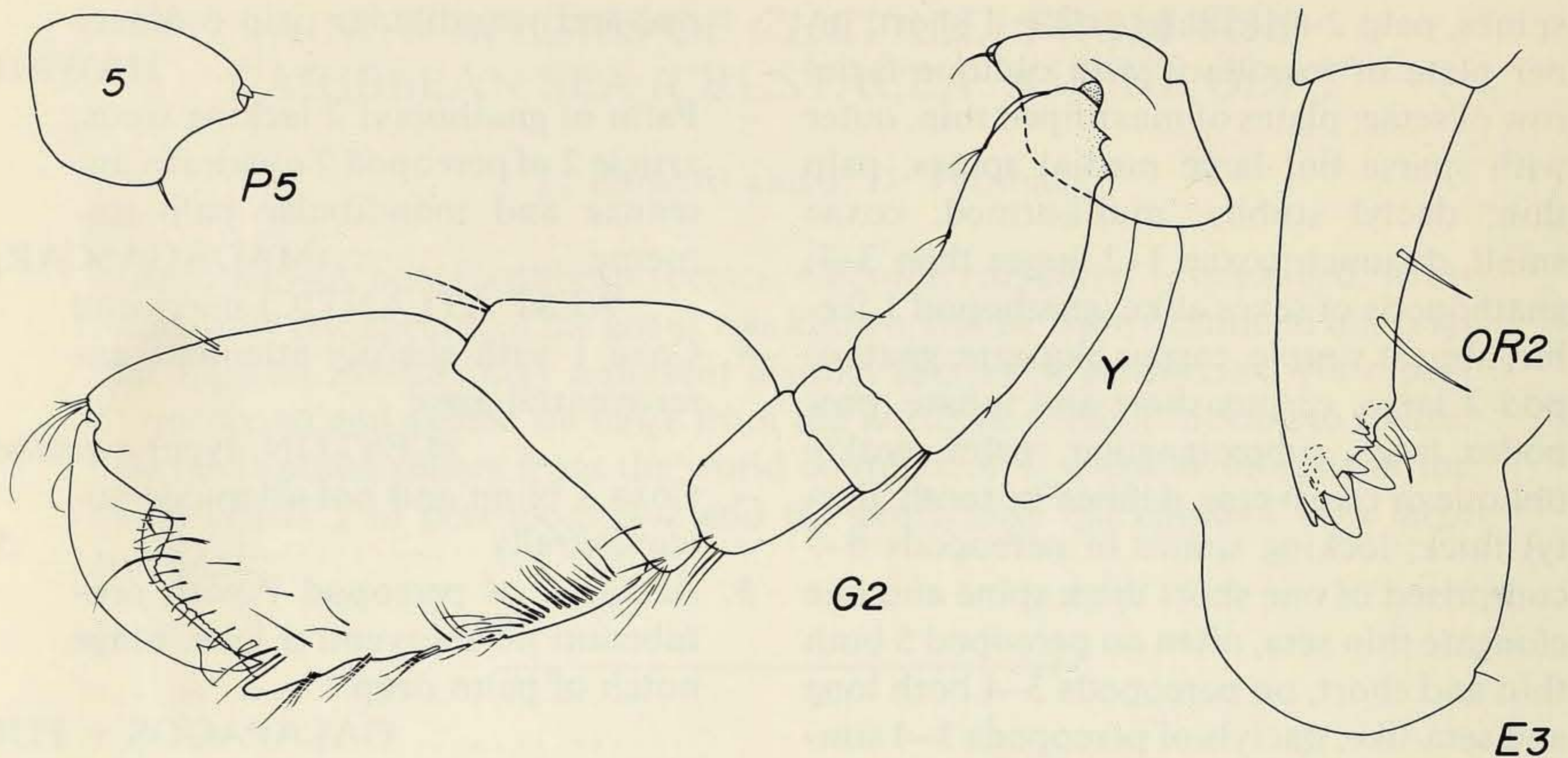


Fig. 1. *Chevalia* sp., Galapagos, male "p."

*Diagnosis.*—Accessory flagellum 2-articulate, article 1 elongate (Walker probably overlooked tiny article 2); anteroventral corner of coxa 1 attenuate and sharp; coxa 2 [?weakly excavate ventrally]; palm of gnathopod 2 oblique, notch near hinge absent; article 2 of pereopod 7 with weakly protuberant posteroventral corner, article 4 slender. [Unknown are gills, oostegites and minute details on outer ramus of uropod 2.]

*Distribution.*—Indian Ocean.

*Chevalia inaequalis* (Stout), California

*Neophotis inaequalis* Stout, 1913:653.

*Chevalia aviculae*: Shoemaker, 1942:39.—

J. L. Barnard, 1962:17, fig. 5.—Conlan, 1983:61, fig. 32.

*Diagnosis.*—Accessory flagellum 2-articulate, article 1 shortened; anteroventral corner of coxa 1 blunt; coxa 2 weakly excavate or flat ventrally; palm of gnathopod 2 oblique, notch near hinge moderate; article 2 of pereopod 7 not protuberant at posteroventral corner, article 4 stout; outer ramus of uropod 2 with 2 marginal setae.

*Material.*—Allan Hancock Foundation *Velero IV* 5164 (reexamination of material reported by J. L. Barnard 1962).

*Distribution.*—British Columbia to outer Baja California.

*Chevalia* sp., Galapagos

Fig. 1

*Chevalia aviculae*: J. L. Barnard, 1979:24.

*Diagnosis.*—Accessory flagellum 2-articulate, article 1 elongate; anteroventral corner of coxa 1 blunt; coxa 2 weakly excavate or convex ventrally; palm of gnathopod 2 oblique, notch near hinge deep; article 2 of pereopod 7 protuberant at posteroventral corner, article 4 stout; outer ramus of uropod 2 with 2 marginal setae.

*Material.*—JLB Galapagos 40 (reexamination of material reported by J. L. Barnard 1979).

*Distribution.*—Galapagos Islands.

*Chevalia* sp., Fiji

*Chevalia aviculae*: Myers, 1985:76–80, fig. 59.

*Diagnosis.*—Accessory flagellum 2-articulate, article 1 elongate; anteroventral corner of coxa 1 blunt; coxa 2 almost straight ventrally; palm of gnathopod 2 oblique,

notch near hinge moderate to strong; article 2 of pereopod 7 protuberant at posteroventral corner, article 4 slender; outer ramus of uropod 2 with 1 marginal seta.

*Distribution.*—Fiji.

*Chevalia* sp., Hawaii

*Chevalia aviculae*: J. L. Barnard, 1970:166–167, fig. 105.

*Diagnosis.*—Accessory flagellum 2-articulate, article 1 elongate; anteroventral corner of coxa 1 blunt; coxa 2 weakly excavate or convex ventrally; palm of gnathopod 2 transverse, notch near hinge deep; article 2 of pereopod 7 strongly protuberant at posteroventral corner, article 4 slender; outer ramus of uropod 2 with 2 marginal setae.

*Material.*—JLB Hawaii 6 (reexamination of original material, see J. L. Barnard 1970).

*Chevalia mexicana* Pearse

Figs. 2–3

*Chevalia mexicana* Pearse, 1913:374–376, fig. 5.

?*Chevalia aviculae*: Shoemaker, 1921:101.—?Ledoyer, 1982:198, fig. 68.

*Diagnosis* (comparison to *C. aviculae* superspecies and *C. carpenteri*).—Article 3 of antenna 1 about 0.70 times as long as article 1; accessory flagellum 3-articulate, article 1 short. Coxal gill 2 almost as long as other gills. Three pairs of oostegites present (on coxae 3–5). Article 2 of pereopods 5–6 ovate, of pereopod 7 rectilinear, lacking extended or produced posteroventral corner on pereopod 5, but with squared posteroventral corner on pereopods 6–7, article 5 of pereopods 5–7 with 2 main emergent spines; article 4 of pereopod 7 slender. Epimera 1–3 with weakly convex posterior margin, posteroventral notch obsolescent. Apex of outer ramus on uropod 2 with 5+ subsidiary spines directly basal to 3 main distal spines.

*Diagnosis* (comparison to species in *C. aviculae* complex).—Accessory flagellum

3-articulate, article 1 shortened; anteroventral corner of coxa 1 blunt; coxa 2 weakly excavate ventrally; palm of gnathopod 2 almost transverse, notch near hinge weak or absent; article 2 of pereopod 7 not protuberant at posteroventral corner, article 4 slender; outer ramus of uropod 2 with 1 marginal seta.

Antenna 1 unlike other species, about 1.5 times as long as head plus first 4 pereonites together, in *C. mexicana* antenna 1 about 2.3 times as long as “comparative,” antenna 2 concomitant and mandibular palp similarly elongate (mandibular palp cleans antennae); inner basal margin of dactyl on gnathopod 2 with hump.

*Description of female* “w” 4.77 mm.—As in illustrations; primary flagellum of antenna 1 with one aesthetasc on each article except 1, 8, and 10, and one tiny one on article 11; gnathopod 2 with smooth transverse palm, dactyl as long as palm, medial face of article 5 lacking tiny prickles; 3 pairs of oostegites very thin, sparsely setose; ratio of peduncle to outer ramus to inner ramus on pleopods = 30:45:39, outer rami with 10 articles, inner with 8–9, peduncle with 2 coupling hooks, one apical seta (remote from coupling hooks); outer ramus of uropod 1 with lateral and medial fine serrations distally, these absent on outer ramus of uropod 2, this ramus with 1 marginal seta; inner ramus of uropod 2 with large lateral serrations, each small tooth subserrate.

*Male* “v” 3.75 mm.—Like female but body smaller and armaments therefore fewer.

*Distinctions from C. carpenteri.*—Palp of mandible elongate; palp of maxilla 1 with 3 outer facial setae, inner plate of maxilla 2 shortened; outer rami of uropods 1–2 of *C. aviculae* superspecies-form in presence of 5+ subsidiary spine-teeth.

*Illustrations.*—Following parts like *C. carpenteri* and therefore neither described nor illustrated: posterior body, urosome, pleon, upper and lower lips, maxilla 1, maxilliped (but inner plate with 6 medial setae),

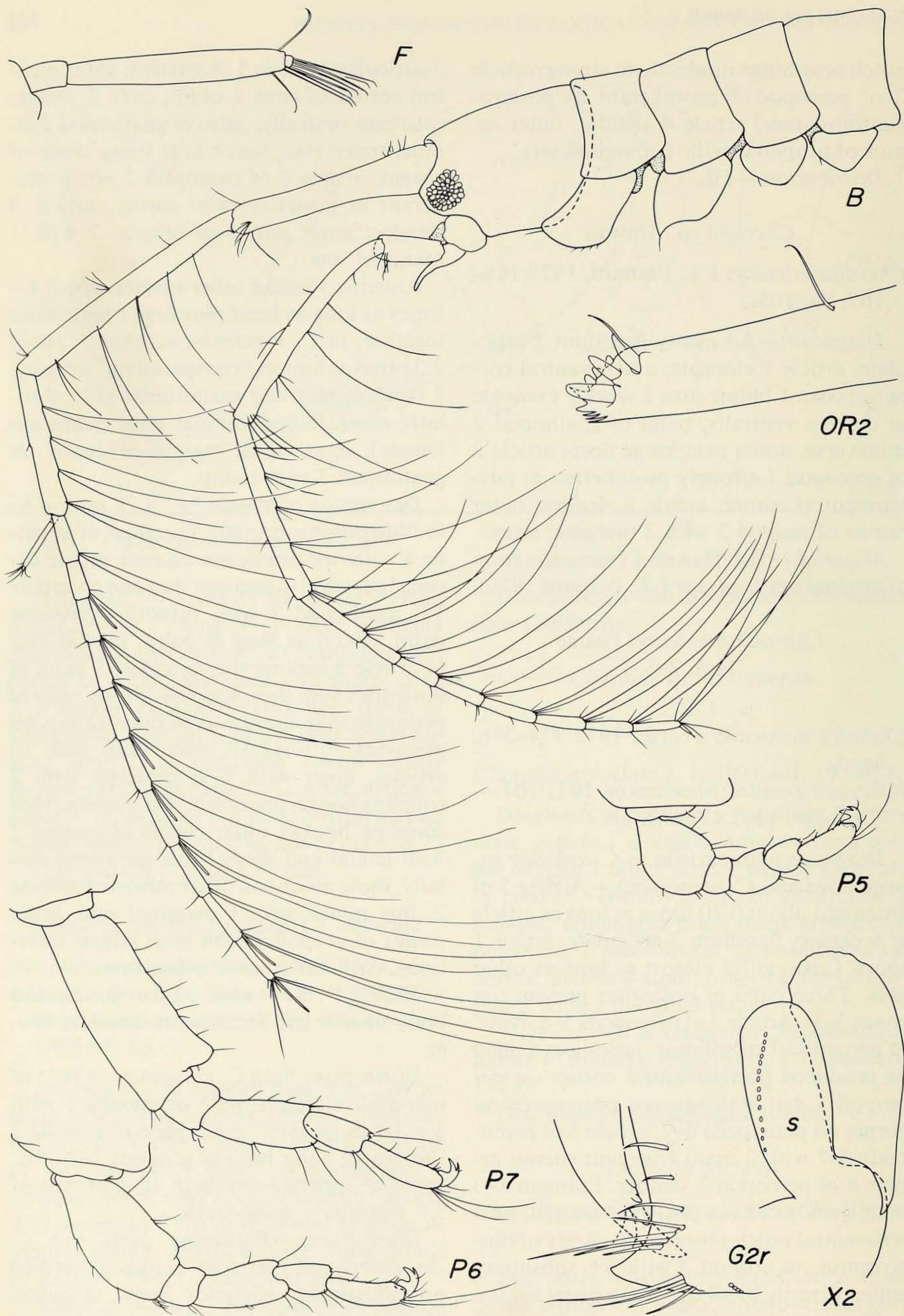


Fig. 2. *Chevalia mexicana*, female "w."

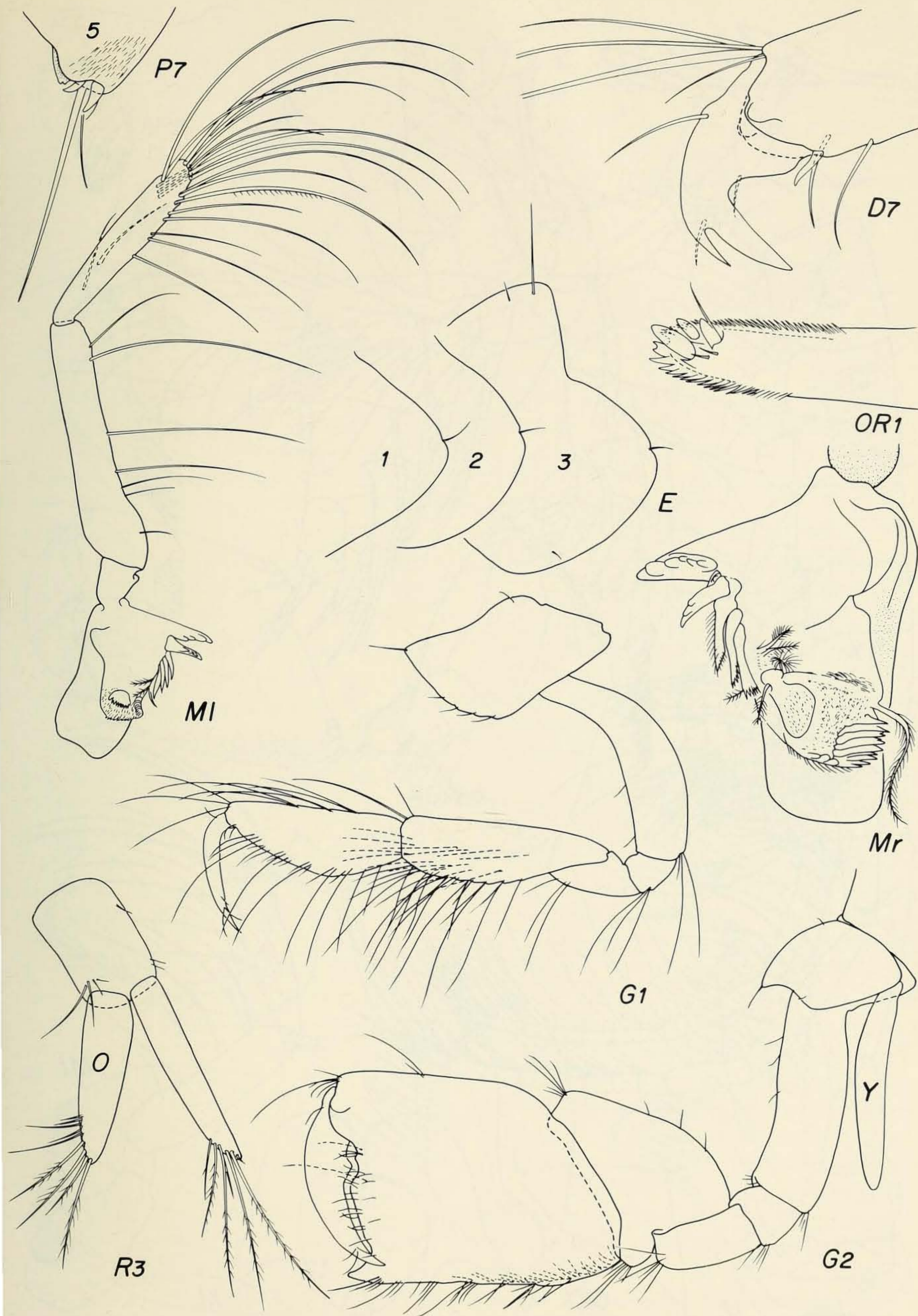


Fig. 3. *Chevalia mexicana*, female "w."

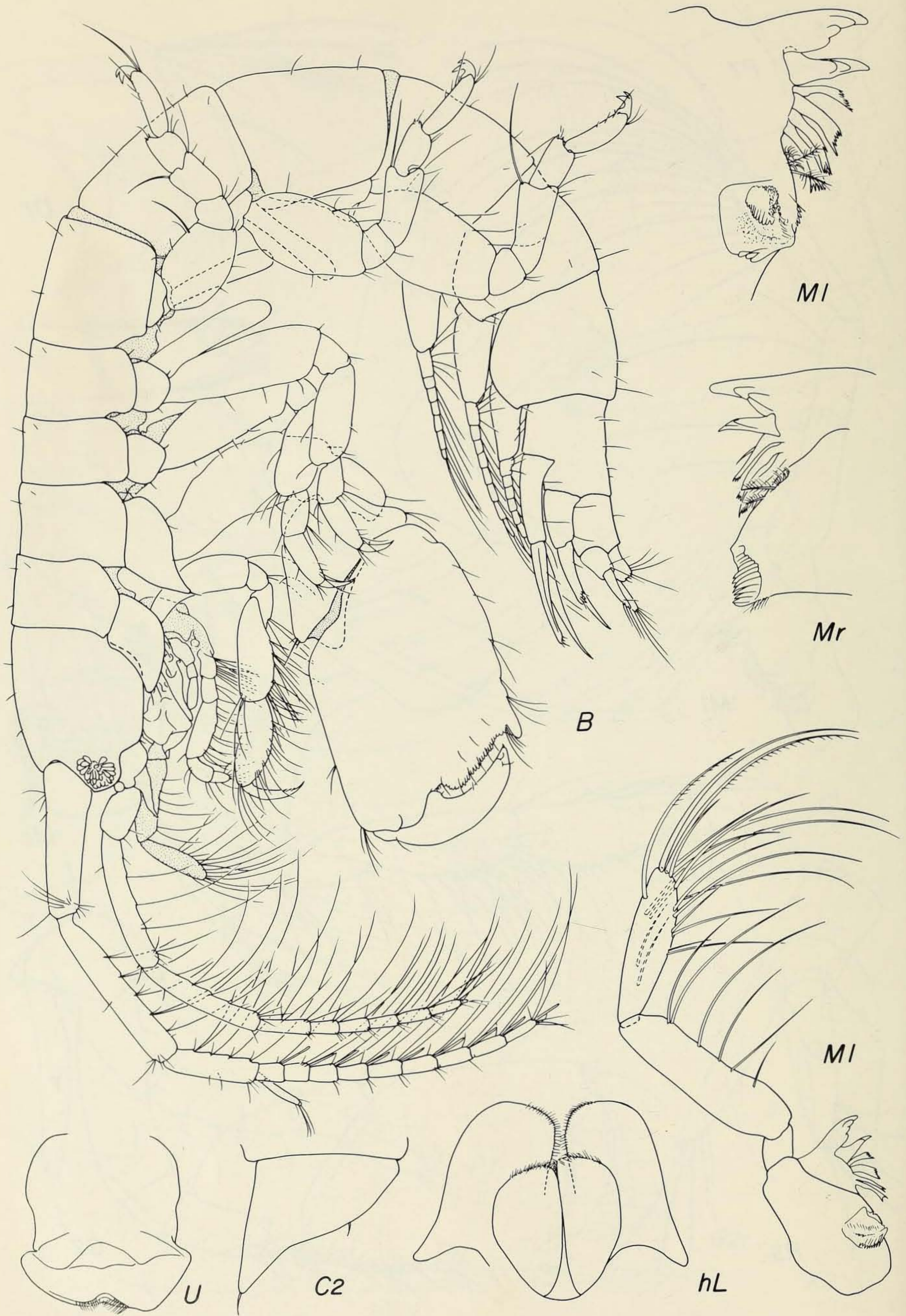


Fig. 4. *Chevalia carpenteri*, female "a" holotype; h = female "h."



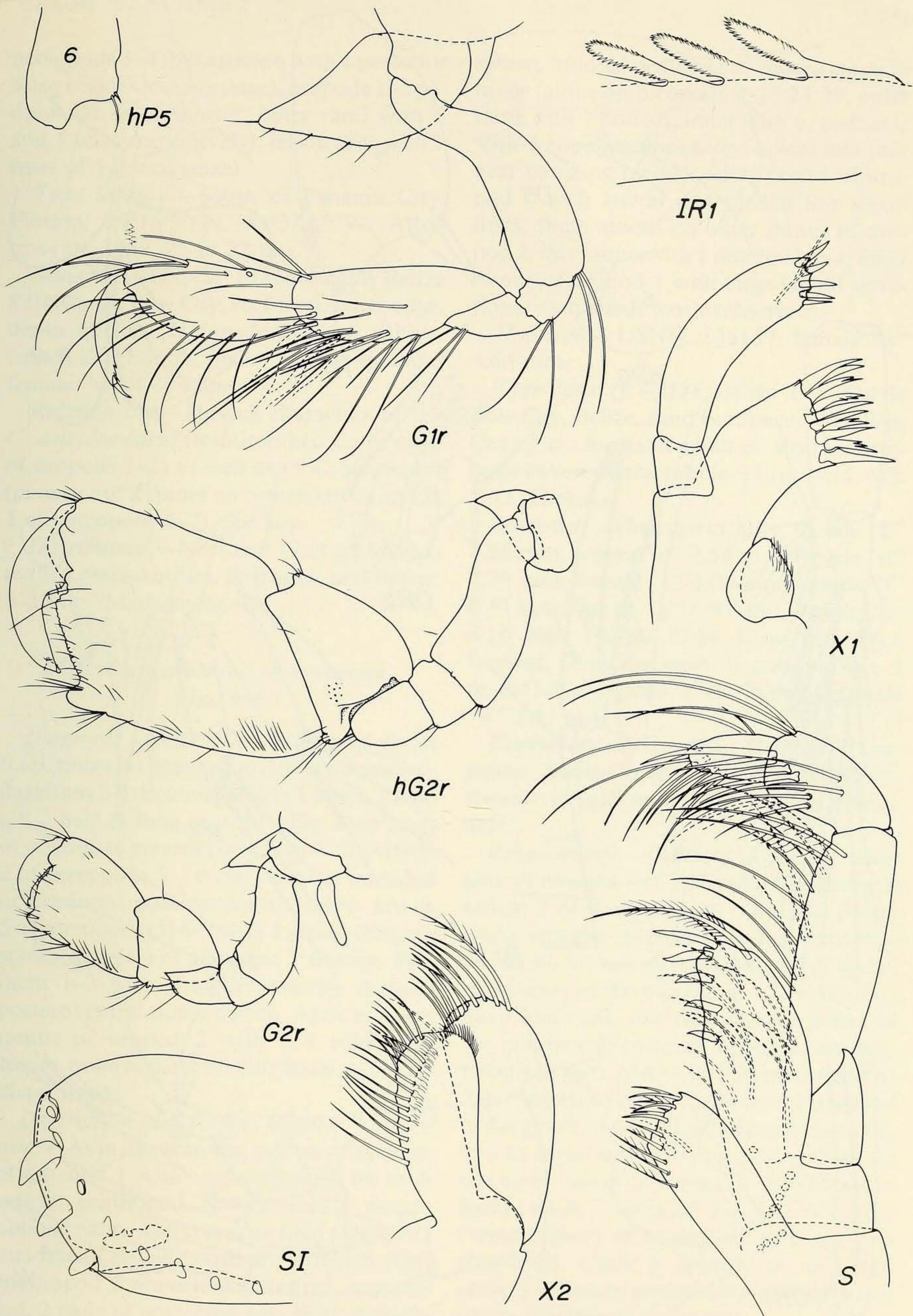


Fig. 5. *Chevalia carpenteri*, female "a" holotype; h = female "h."

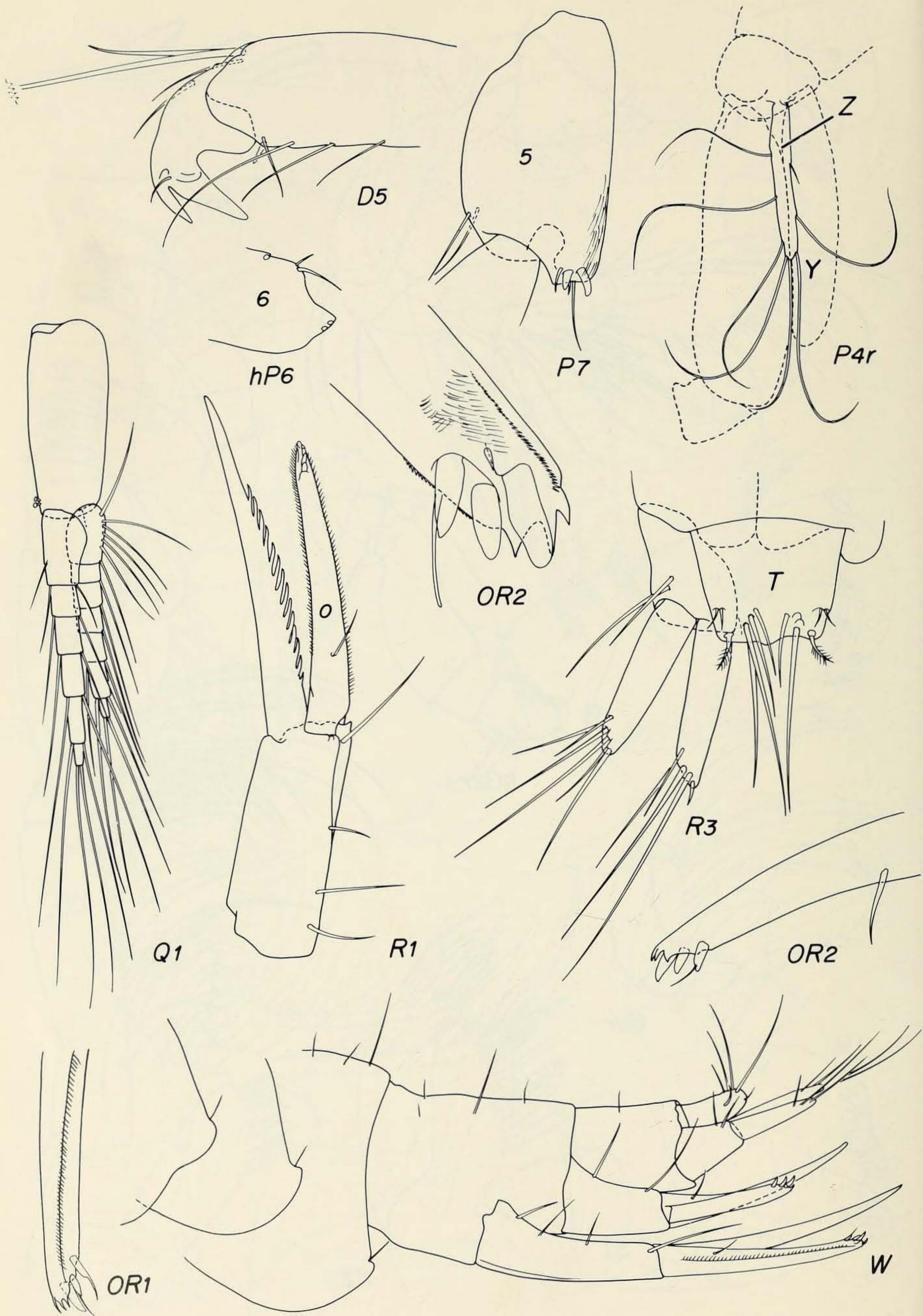


Fig. 6. *Chevalia carpenteri*, female "a" holotype; h = female "h."

pereopods 3–4 (but article 6 with 4 posterior setae besides locking setae), uropods 1–2 peduncular setae shorter, outer rami with 2 and 1 setae respectively), telson (but with 2 rows of 5 dorsal setae).

*Type locality.*—South of Panama City, Florida, 29°16'30"N, 85°32'00"W, Albattross sta 2369, 25 to 27 fms.

*Material.*—USNM 195160, JDT Belize 82B, Carrie Bow Cay, reef crest, outer edge, depth 60 feet, *Halimeda* in coral rubble, coll. J. D. Thomas, male "v" 3.75 mm and female "w" 4.77 mm.

*Relationship.*—Having characters of the *C. aviculae* form (multitoothed outer rami of uropods 1–2) as well as of *C. carpenteri* (presence of 2 spines on posterodistal article 5 of pereopods 5–7). See key.

*Distribution.*—Northern Gulf of Mexico to the Lesser Antilles, Barbados, and Belize, 0–50 m; ?Madagascar.

*Chevalia carpenteri*, new species

Figs. 4–6

*Diagnosis.*—Article 3 of antenna 1 about 0.60 times as long as article 1; accessory flagellum 3-articulate, article 1 short. Coxal gill 2 half as long as other gills. Two pairs of oostegites present (on coxae 4–5). Article 2 of pereopods 5–7 ovate, lacking extended or produced posteroventral corner; article 5 of pereopods (5) 6–7 with 2 main emergent spines; article 4 of pereopod 7 slender. Epimera 1–3 with straight posterior margin, posteroventral notch strong. Apex of outer ramus of uropod 2 with 2–3 subsidiary spines, none of these directly basal to 3 main distal spines.

*Description of holotype, female "a" 4.64 mm.*—As in illustrations; primary flagellum of antenna 1 with one aesthetasc on each article; gnathopod 2 with weakly serrate oblique palm, dactyl shorter than palm, medial face of article 5 with tiny prickles; right gnathopod 2 abnormally stunted, regenerant; 2 pairs of oostegites very thin, sparsely

setose; ratio of peduncle to outer ramus to inner ramus on pleopods = 23:24:29, outer rami with 7 articles, inner with 6, peduncle with 2 coupling hooks, one apical seta (not near coupling hooks); outer ramus of uropod 1 with lateral and medial fine serrations, these absent on outer ramus of uropod 2, this ramus with 1 marginal seta; inner ramus of uropod 1 with large lateral serrations, each small tooth subserrate.

*Holotype.*—USNM 195157, female "a" 4.64 mm.

*Type locality.*—JDT Belize 105, Carrie Bow Cay, Belize, sand bores near Wee Wee Cay, 1 m, formalin wash of algal/invertebrate covered coral rubble, 21 Jul 1984, coll. J. D. Thomas.

*Material.*—The type locality, female "b" 2.96 mm, female "c" 2.54 mm, female "d" 2.79 mm, female "e" 3.04 mm, female "f" 2.51 mm, female "g" 1.93 mm, female "h" 3.16 mm; Florida Keys, Looe Key Reef, forereef, formalin wash of coral rubble, 5 m, 8 Oct 1983, coll. J. D. Thomas, female "n" 2.37 mm.

*Etymology.*—Named for Michael R. Carpenter, Smithsonian Institution, whose assistance in field endeavors has been invaluable.

*Relationship.*—Differing from the complex of morphs in *C. aviculae* by the ovate article 2 of pereopods 5–7 and the posteriorly straight epimera with large notches. As far as we can determine (except for *C. mexicana*) in the morphs of *C. aviculae* we have observed, our new species differs in the presence of two tiny spines on the posterodistal apex of article 5 on pereopods 6–7 in contrast to one spine in the type species of the genus. Also, the new species has only two to three subsidiary spines or teeth on the outer ramus of uropod 2 in contrast to five to six in *C. aviculae*, has only two pairs (versus three) of oostegites, and gill 2 is shortened. Coxa 2 appears to be more sharply attenuate anteroventrally than in any of the morphs of *C. aviculae*.

### Acknowledgments

We thank Dr. Klaus Rützler and Mike Carpenter of Smithsonian Institution for field support on Carrie Bow Cay, Belize. We thank Linda B. Lutz of Vicksburg for inking our plates. The second author was supported by NSF Grant BSR-8515186. This is contribution 193 from the Smithsonian Reef and Mangrove Project, Carrie Bow Cay, Belize.

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