5-1-1986

New Genera and Species of the Megaluropus Group (Amphipoda, Megaluropidae) from American Seas

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BULLETIN OF MARINE SCIENCE, 38(3): 442–476, 1986

NEW GENERA AND SPECIES OF THE *MEGALUROPUS* GROUP (AMPHIPODA, MEGALUROPIDAE) FROM AMERICAN SEAS

J. D. Thomas and J. L. Barnard

ABSTRACT

The species of the *Megaluropus* group, here placed in three genera, two of which are described as new, are reported from the Caribbean Sea and the eastern Pacific Ocean. The west African *Megaluropus longimerus* Schellenberg is redescribed and a lectotype chosen. It is placed in the new genus *Gibberosus* which otherwise has three American species, *G. falciformis, G. myersi,* and a new species, *G. devaneyi. Megaluropus* is now confined to the Old World. A second new genus from the New World, *Resupinus,* is described to include *R. visendus* and two new species, *R. spinicaudatus* and *R. coloni.* These organisms have been observed to walk upside down in a cradle of their legs similar to melphidippids.

The presence or absence of medial maxillary setae and the presence or absence of a lobe on the merus (article 4) of gnathopod 2 are used to divide the world species of *Megaluropus* Hoek into three genera, two of which are described here as new.

Observations of live *Gibberosus myersi* in the Florida Keys, and *Resupinus spinicaudatus* in Belize, reveal that they feed by perching upside down and filtering suspended material from the water column. Pereopods 3 and 4 are directed forward for balance, while pereopods 5–7 are directed posteriorly (as illustrated). When disturbed, the amphipods swim rapidly for several seconds and then settle back to the substrate where they return to the upside down position. The formation of this "cradle" is similar to that shown for melphidippids by Enequist (1950).

METHODS AND MATERIALS

Materials from many sources have been employed in this study. Specimens of this family present difficulties due to their extremely fragile nature. Uropod 3, which is paddle-shaped, falls off of most individuals when preserved or treated roughly in sample washing. The apices of pereopods 5–7 also are usually broken. The dorsal ornamentation on the pleon (of strong taxonomic importance) can be eroded by rough washing procedures. Many specimens long preserved in museums develop a matrix of crystals or fibers which is difficult to remove for clarification of small characters; the specimens usually turn brown and become almost parchment-like in certain collections. The specimens of *G. devaneyi* collected by J. T. Enright are in the best condition probably owing to careful techniques of collecting, gentle washing, quick-killing (or perhaps anesthetization) and initial preservation in formaldehyde followed by transfer to ethyl alcohol after a few days. Many of these specimens have retained uropod 3 and the apex of pereopod 7. Many, however, have lost apices of pereopods 5–7, and uropod 3.

In our figures capital letters refer to amphipod parts in the following list; lower case letters to right of capital letters or in body parts refer to list of adjectives below; lower case letters to left of capital letters refer to specimens as noted in the legends and text; parts without lower case letters to the left refer to a main unattributed specimen: B, body; C, coxa; D, dactyl; E, epimeron(a); G, gnathopod; H, head; I, inner plate or ramus; K, spine; L, labium; M, mandible; O, outer plate or ramus; P, pereopod; R, uropod; S, maxilliped; T, telson; U, labrum; V, palp; W, pleon; X, maxilla; Y, gill; Z, oostegite. f, flattened; l, left; m, medial; o, opposite; q, oblique; r, right; s, setae removed.

Megaluropidae

Diagnosis.—Body compressed laterally; all urosomites free. Rostrum small. Eyes lateral, large.

Upper lip with ventral notch. Mandibles with projecting, toothed incisors, toothed right and left laciniae mobiles, triturative molars, 3-articulate palps with A(B)DE setae. Lower lip with fleshy inner lobes, long mandibular lobes and facial humps on mandibular lobes. Inner plate of maxilla 1 fully setose medially, with apical nipple-like extension; outer plate with 9+ spines; palp 2-articulate, symmetrical on right and left sides. Plates of maxilla 2 broad, inner with strong, oblique facial row of setae. Plates of maxilliped well developed, outer with strong medial spines, palp 4-articulate, dactyl stubby, with large nail.

Anterior coxae diverse, coxa 3 smallest, coxa 2 often smaller than 1, coxa 4 generally trowel-shaped and tapering, posterodorsal excavation small; coxae 5–7 shorter than 4. Gnathopod 1 simple, carpus long but not lobate. Gnathopod 2 sexually diverse, enlarged in male, but basically simple though dactyl closing on undefined palm.

Pereopods 3–4 with bent article 2 so as to emerge from coxal bundle and project above head for walking and perching upside down. Pereopods 5–7 increasingly elongate, article 2 expanded, article 6 of pereopod 7 very elongate (often missing on specimens). Coxal gills unpleated, on coxae 2–6 or 2–7. Oostegites slender, strap-shaped, poorly setose.

Pleopods 1–2 with cusp on posterodistal lateral apex of peduncle, peduncles elongate, rami subequally long and like each other, coupling hooks 2. Epimera broad. At least one pleonite dorsally cuspidate transversely, at least pleonite 6 with dorsal spines arranged transversely.

Rami of uropods 1–2 strongly spinose apically, marginal spines sparse, uropod 1 with basofacial spines. Rami of uropod 3 broadly expanded, paddle-shaped, peduncle short. Telson deeply cleft, with at least apical spines.

Sexual Dimorphism.—Most species apparently with terminal pelagic male bearing enlarged eyes, elongate flagellum of antenna 2, anterior setular tufts on peduncle of antenna 2, enlarged eyes, enlarged and distinctive gnathopod 2, more streamlined and less spiny pleon, and larger pleopods than in female.

Generic Variables.—Generic taxonomy based on strong or weak medial setation of maxillae 1–2 and the presence or absence of a large metacarpal lobe on female gnathopod 2.

Specific Variables.—Lateral cephalic lobe with or without large, and sharp or small blunt, cusp. Coxal shapes and setation variable. Article 6 of pereopod 7 multisegmented or not. Ventral armaments of epimera variable. Epimeron 3 with or without deep posterior serrations. Pleonite 5 dorsally serrate, occasionally spinose, other pleonites dorsally serrate in varying degrees. Basofacial spines on peduncle of uropod 1 long, short or mixed; interramal tooth of uropod 1 present or absent; basodorsal setae on peduncular ridge of uropod 1 with setae, spines, or naked. Outer face of peduncle on uropod 3 naked or spinose; rami narrowly or broadly paddle-shaped. Telson with large dorsal spines or tiny dorsal setules.

Key to the World Genera of Megaluropidae

1a. Merus of gnathopod 2 strongly lobate distally ..... *Gibberosus* new genus
1b. Merus of gnathopod 2 not strongly lobate 2
2a. Inner plate of maxilla 1 with 0–1 strong seta, inner plate of maxilla 2 with only 1 seta in facial row ..... *Resupinus* new genus
2b. Inner plate of maxilla 1 strongly setose medially, inner plate of maxilla 2 with many setae in facial row ..... *Megaluropus* Hoek

Key to American Genera of Megaluropidae

1a. Male rostrum short; ocular lobe of head bearing sharp angle; accessory flagellum 2-articulate; maxillae well setose medially; merus of gnathopod 2 strongly produced; interramal tooth present on peduncle of uropod 1; spines of telson large ..... *Gibberosus*

1b. Male rostrum long; ocular lobe of head lacking sharp angle; accessory flagellum 1-articulate; maxillae poorly setose medially; merus of gnathopod 2 not produced; uropod 1 lacking interramal tooth; spines of telson small ..... *Resupinus*

Megaluropus Hoek

Megalonoura Herdman, 1889: 197 (nomen nudum).
Megaluropus Hoek, 1889: 39.—Chevreux and Fage, 1925: 225.
Phylluropus K. H. Barnard, 1932: 145.

Diagnosis.—Rostrum short. Ocular lobe of head lacking sharp angle or cusp. Accessory flagellum 2-articulate. Maxillae well setose medially. Metacarpus of gnathopod 2 unproduced along carpus. Peduncle of uropod 1 without interramal tooth. Spines on telson small or short.

Description.—Upper lip weakly notched below from anterior view. Mandibular lobes of lower lip [?with facial extensions pointing axially]. Inner plate of maxilla 1 leaf-like but [?without apicolateral pointed extension]. Inner plate of maxilla 2 broader than outer. Coxae 1–2 subtruncate below. Coxa 4 tapering. Coxa 5 without anterodorsal lobe. Main armaments of article 5 on pereopods 3–4 setae, not spines. Pleonite 6 [?without large dorsal spines]. Telson never with numerous small dorsal prickle spines.

Type-species.—*Megaluropus agilis* Hoek, 1889, monotypy (=*Phylluropus capensis* K. H. Barnard, 1932) (eastern Atlantic Ocean).

Composition.—*Megaluropus excavatus* Ledoyer, 1979 (Madagascar); *Megaluropus massiliensis* (Ledoyer, 1975, as *M. agilis massiliensis*) (Mediterranean); *Megaluropus monasteriensis* Ledoyer, 1975 (Mediterranean); *Megaluropus namaquaaensis* Schellenberg, 1953 (southwest Africa); *Tulearogammarus sinuatus* Ledoyer, 1968 (as *Megaluropus* in Ledoyer, 1979) (Madagascar).

Key to the Species of *Megaluropus*

(See key of Ledoyer, 1975)

Resupinus new genus

Diagnosis.—Male rostrum long. Ocular lobe of head rounded. Accessory flagellum 1-articulate. Maxillae poorly setose medially, inner plate of maxilla 1 with only 0–1 apical seta, facial row on inner plate of maxilla 2 with only 1 seta. Merus of gnathopod 2 unproduced. Peduncle of uropod 1 without interramal tooth. Spines on telson small or absent.

Description.—Coxa 4 not tapering distally; coxa 5 with anterodorsal lobe pointing forward. Telson often bearing numerous small prickle spines.

Etymology.—Named for the habit of lying on sediments on its back upside down similar to *Melphidippa* as shown by Enequist, 1950.

Type-species.—*Resupinus spinicaudatus* Thomas and Barnard new species.

Composition.—*Megaluropus visendus* J. L. Barnard, 1969; *Resupinus coloni* new species.

Relationship.—This genus differs from *Megaluropus* in the loss of most of the

medial setae on the inner plate of maxilla 1 and the loss of most of the setae on the facial row of the inner plate on maxilla 2. The accessory flagellum is reduced to one article. The rostrum is longer than in other species described in the family.

Notes.—Opposite inner plates of maxilla 1 have clustered and widely spread marginal setules.

KEY I TO THE SPECIES OF *RESUPINUS*

1a. Pleonites 4–5 serrate dorsally ..... *R. coloni* new species
1b. Pleonites 4–5 smooth dorsally 2
2a. Epimeron 3 finely and densely serrate, telson not dorsally spinose ..... *R. visendus* J. L. Barnard, 1969
2b. Epimeron 3 grossly and sparsely serrate, telson dorsally spinose ..... *R. spinicaudatus* new species

KEY II TO THE SPECIES OF *RESUPINUS*

1a. Telson strongly spinose dorsally ..... *R. spinicaudatus*
1b. Telson not spinose dorsally 2
2a. Pleonites 4–5 dorsally smooth ..... *R. visendus*
2b. Pleonites 4–5 dorsally serrate ..... *R. coloni*

Resupinus spinicaudatus new species
Figures 1–5

Diagnosis.—Eye in either sex not filling entire ocular lobe. Some facial setae on epimera 1–3 arranged in vertical pairs, triads or quartets; notches or serrations on epimeron 3 sparse and shallow. Dorsal pleonal serrations present on only segments 2 and 3. Telson with numerous small dorsal prickle spines.

Description of Holotype Female 2.44 mm.—Ocular lobe barely drooping, eye composed of ommatidia surrounded by weak coffee-colored pigmentary stain (in alcohol); rostrum moderately pointed. Antenna 1 reaching apex of peduncle on antenna 2, article 2 scarcely shorter than article 1, article 3 much shorter, accessory flagellum 1-articulate, primary flagellum 8-articulate, 2 articles next to last each with aesthetasc. Article 4 of antenna 2 about 60% as long as article 5, flagellum slightly longer than articles 3–5 of peduncle, 12-articulate.

Epistome unproduced, upper lip broadly truncate below, smooth. Right incisor weakly 2-toothed, left simple; each lacinia mobilis simple and sharp but left much thicker than right. Right rakers 4, left 5; molar weakly triturative. Palp article 3 about 60% as long as article 2, weakly expanded, with 2 facial setae, D setae = 4, E setae = 3, article 2 with about 6 medial and 4 facial setae. Dorsolateral edges of main lobes on lower lip sinuate, inner lobes fleshy, mandibular lobes strong. Inner plate of maxilla 1 with 1 apical seta and cluster of medial hair-like setules; outer plate with eleven spines, several bifid or weakly so; palp 2-articulate, with 2 rows of 4 and 6–7 apical spines, 2 spines of long row placed medially, spines diverse. Inner plate of maxilla 2 narrower than outer, face with one seta in row near outer edge, medial margin with 5 setae in partial pairs. Inner plate of maxilliped with 3 main stout spines but only 1 medial seta; outer plate with large medial cusp spines and 2 thinner spical spines, palp poorly setose laterally, article 4 short, stubby, bearing thick nail of similar length and 2 accessory setae.

Coxae 1–2 broadly truncate and widely setose below, coxa 3 evenly linguiform, rounded and setose below, coxa 4 broad, not sinuate, posterior margin barely concave, setae minute; coxa 5 with anterodorsal lobe pointing forward, poorly

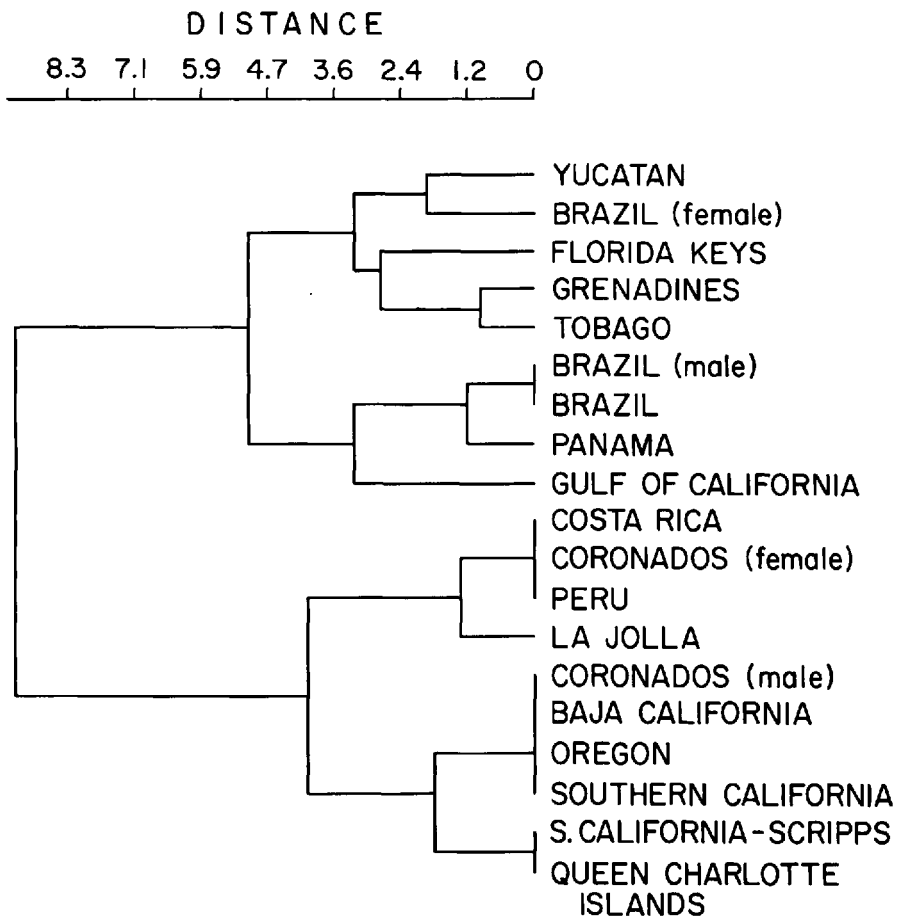

Figure 1. Dendrogram of 8 characters in 17 localities based on Manhattan-Metric Distances for demes of *Gibberosus myersi*.

developed anteroventral lobe and slightly larger posteroventral lobe; anteroventral lobe of coxa 6 large; setae of coxa 7 divided into anterior and posterior groups of 2 and 4. Gnathopods small, both simple, merus not extended along carpus very far, carpus of gnathopod 1 thick, weakly lobate proximally, carpus of gnathopod 2 broadly lobate, triangular, setae confined to distal margin of lobe, hand much thinner than on gnathopod 1.

Pereopods 3–4 alike, article 2 bent basally so as to project in front of coxae and overhead for support while lying on back, setae of article 5 densest and widely spread, setae of article 6 fewer and confined apically, dactyl stubby and bearing apical seta. Article 2 of pereopods 5–7 pyriform, with posteroventral lobe, anterior bulge weakest on pereopod 7, posterior serrations largest but fewest on pereopod 7. Gills present on coxae 2–7, gill 7 smallest, gill 5 largest; brood plates small, thin, on coxae 2–5, setal formulas, apical = 4-3-3-3, anterior = 1-6-4-6, posterior = 1-1-0-1, posterior setules = 2-1-3-1.

Only pleonites 2–3 weakly serrate dorsally, only epimera 2–3 with strong convexity, epimera 2–3 with small posteroventral tooth, epimeron 1 with tooth obsolescent. Uropods 1–2 lacking interramal tooth, all margins normally spinose. Flat outer face of peduncle on uropod 3 with row of 5 spines, paddle-shaped rami

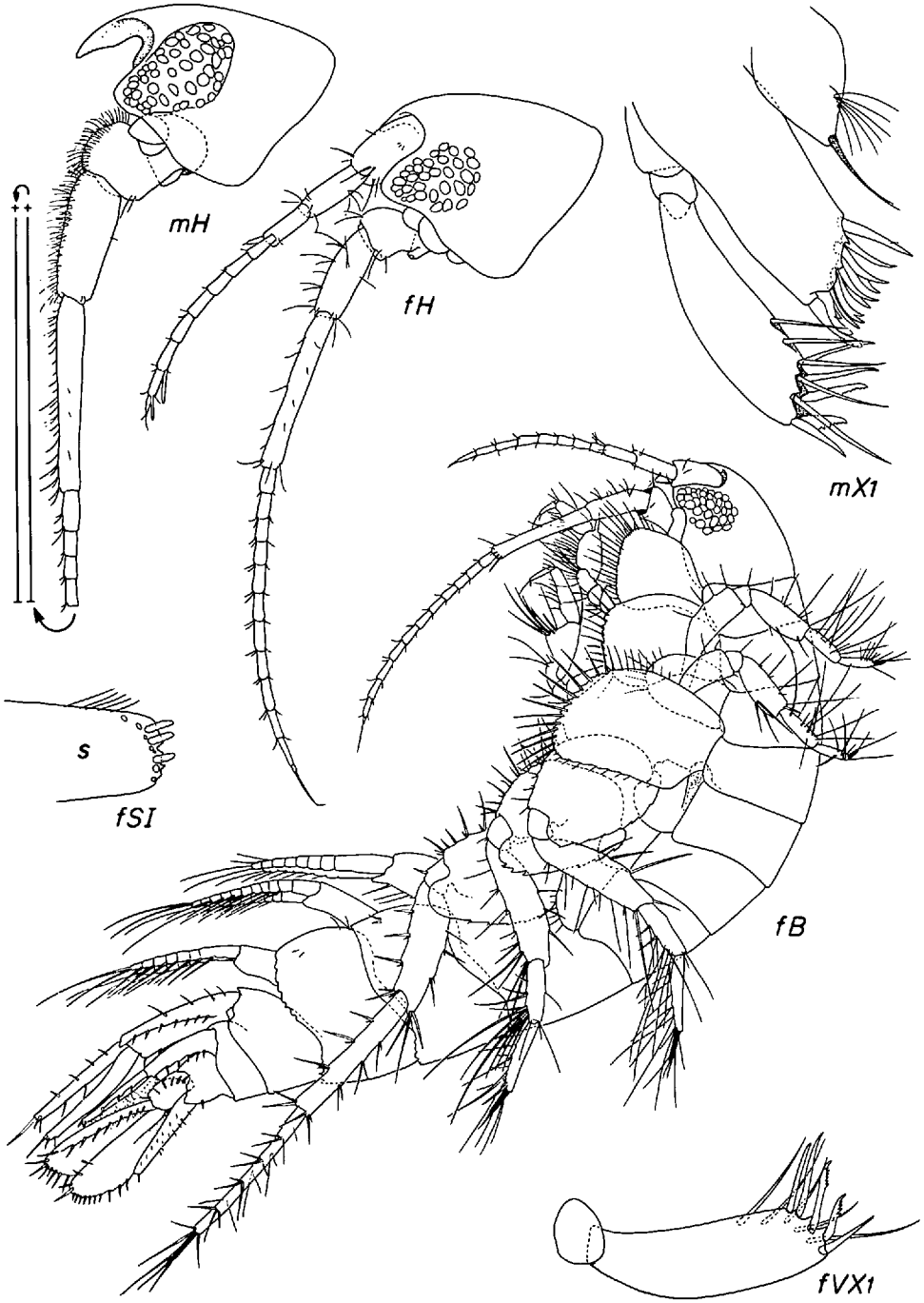

Figure 2. *Resupinus spinicaudataus* new species, m = male "m"; f = female "f".

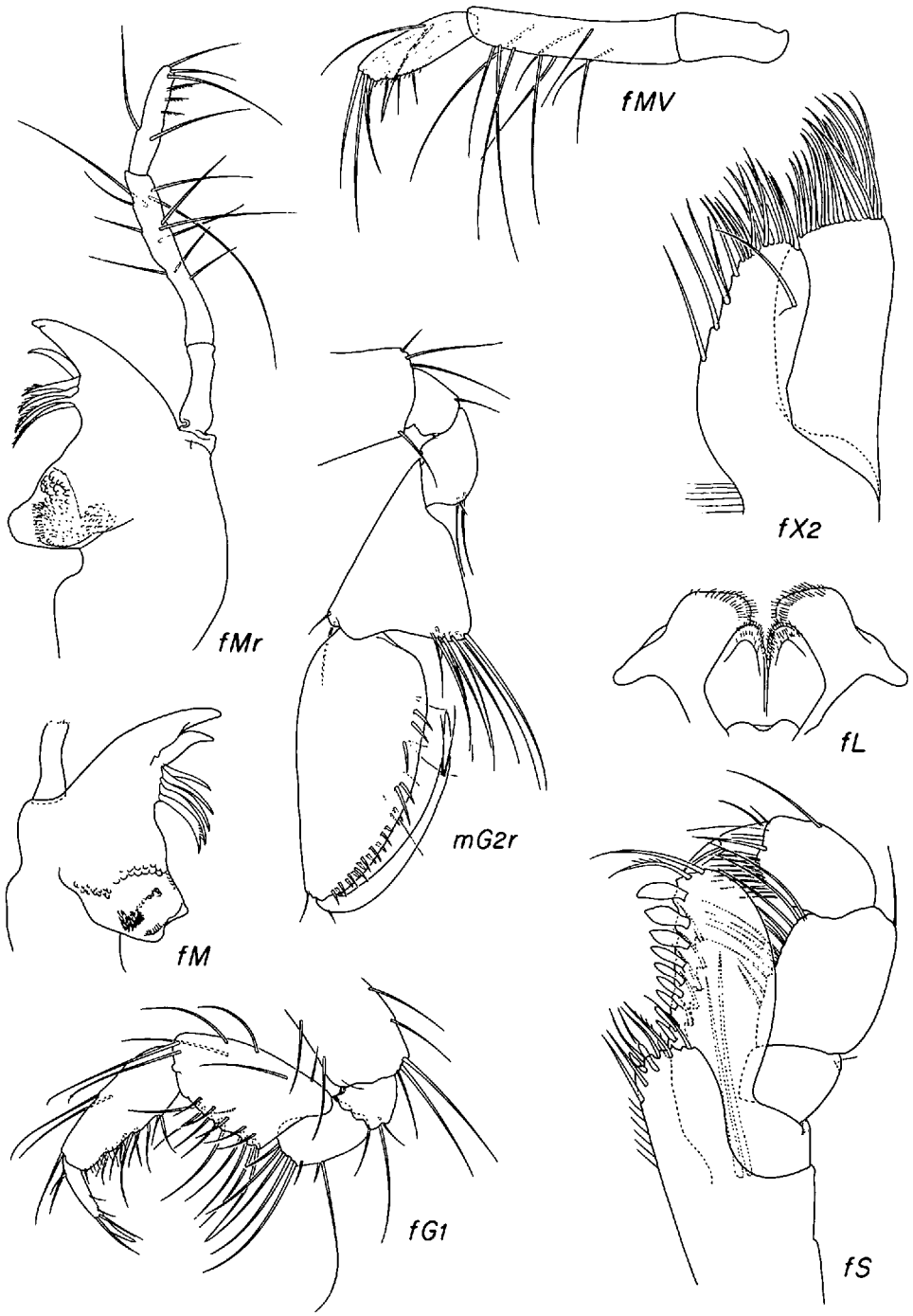

Figure 3. *Resupinus spinicaudatus* new species, m = male "m", f = female "f".

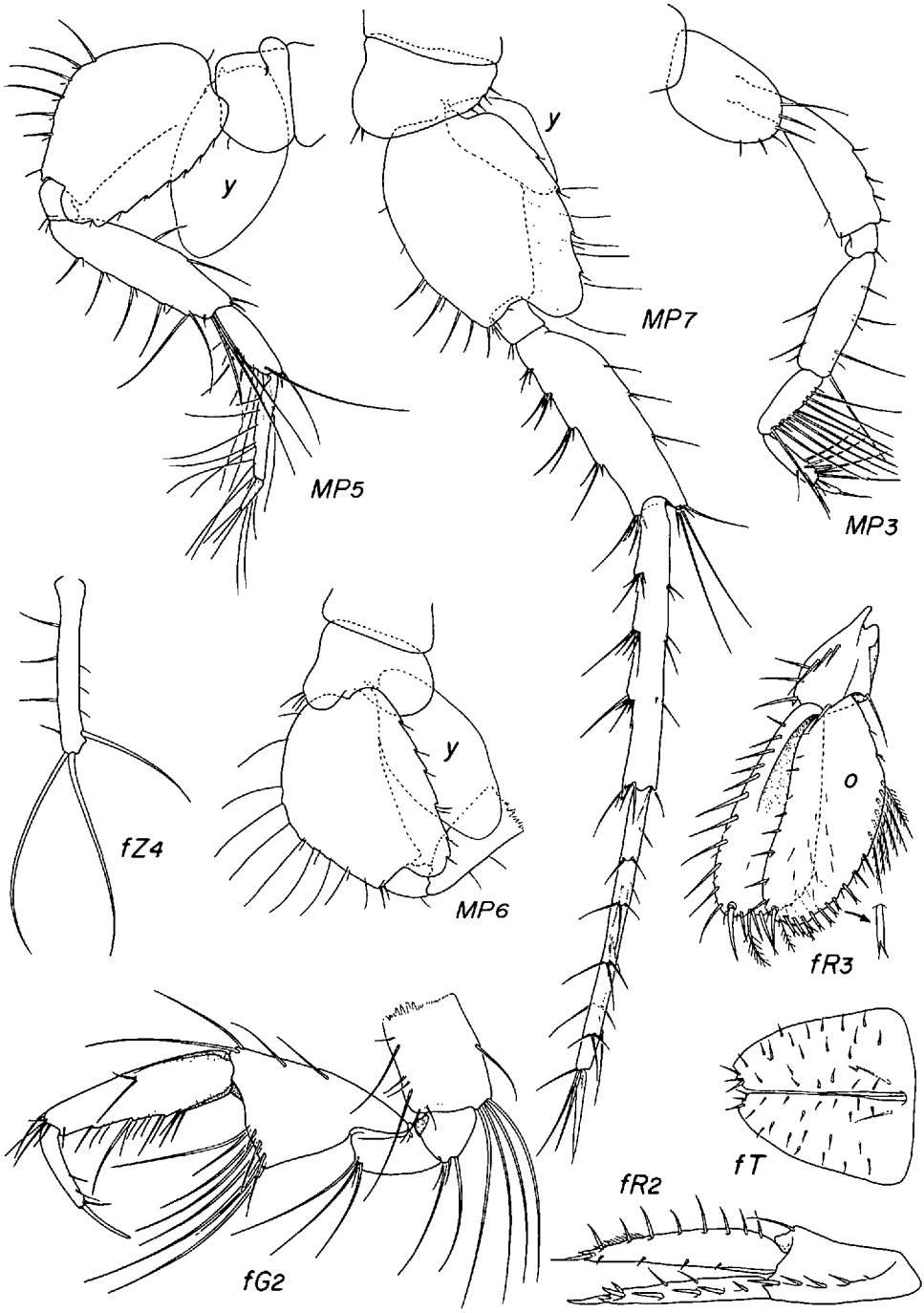

Figure 4. *Resupinus spinicaudatus* new species, m = male "m", f = female "f".

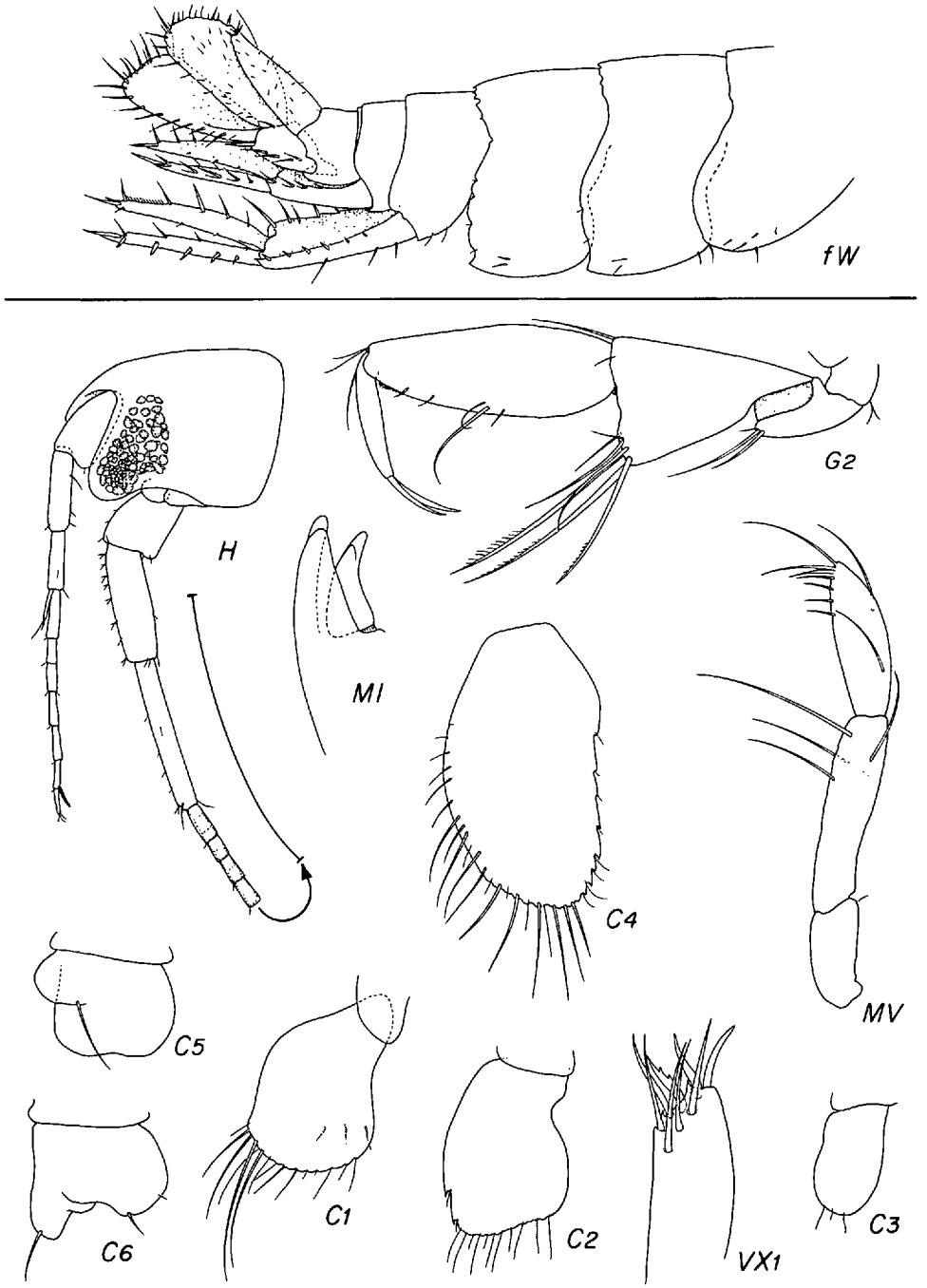

Figure 5. Upper, *Resupinus spinicaudatus* new species, female "f". Lower, *Resupinus visendus* new species, male "n".

with complex setation as shown in illustration, inner ramus with 2 large apical setae bearing large basal bulbs. Telson cleft almost to base, each lobe with conspicuous basoventral seta, dorsal surface densely furnished with small spinules, each apex with 2–3 spines.

Male "m" 2.36 mm.—Like female but rostrum, eyes, and pleopods larger, antenna 2 much longer and peduncle bearing dense anterior tufts of setules; gnathopod 1 like female but article 6 posterior margin lined medially with fine setae forming comb; gnathopod 2 enlarged, wrist similar but larger than in female, hand elongate, almond-shaped, palm and posterior margin of hand continuous, lined distally with short spines, proximally with long spines, dactyl long, slender, smooth except for 2 subapical facial setae. Epimeron 1 with 4 facial setae, epimeron 2 with 3 posterofacial setae in group, and 3 anteroventral marginal setae; epimeron 3 with 3 posterofacial setae in group and 3 anteroventral spines and setae, posterior setule notches on epimera 2 and 3 = 3 and 6. Uropod 3 missing.

Variations.—Female "a" 2.94 mm: Facial setae of epimera 1–3 = 3-2-4; spines on uropods, uropod 1 peduncle ventral = 3, dorsolateral = 9 (basal 3 more elongate than on holotype), outer ramus = 7 lateral, 6 dorsomedial; uropod 2 peduncle with 7 dorsolateral spines (basalmost 4 slightly more elongate than others), outer ramus with 5 lateral, inner ramus with 11 dorsomedial spines.

Female "b" 2.43 mm: Facial setae on epimera 1–3 = 3-3-3; spines on uropods, uropod 1 peduncle ventral = 3, dorsolateral = 6, dorsomedial = 4, outer ramus lateral = 6, inner ramus dorsomedial = 4; uropod 2 peduncle dorsal = 6, outer ramus with 5 lateral, inner ramus with 8 dorsomedial (in both cases including apicalmost spine); peduncle of uropod 3 with 6 facial spines.

Female "c" 2.07 mm (ovigerous): Facial setae on epimera 1–3 = 1-2-1; uropodal spines, uropod 1 peduncle ventral = 2, dorsolateral = 3, outer ramus with 2 lateral, inner ramus regenerant; uropod 2 peduncle = 6 (regenerant), outer ramus with 4 lateral, inner with 7 dorsomedial.

Illustrations.—On body view of female "f" apex of pereopods 5 and 6 added from second source.

Etymology.—Named for the presence of numerous small dorsal spines on the telson.

Holotype.—USNM No. 195133, female "f" 2.44 mm (illustrated).

Type-locality.—JDT Belize 55A, Belize, sandbar on beach north of False Sitee Point, 12 June 1980, 1.2 m depth at 33 m from shore, medium fine sand, coll. J. D. Thomas.

Material.—JDT Belize 78A, female "a" 2.94 mm ovigerous, female "b" 2.43 mm, female "c" 2.07 mm ovigerous; JDT Belize 43, male "m" 2.36 mm (illustrated).

Relationship.—This species differs from its east Pacific cognate, *R. visendus* (J. L. Barnard, 1969), in minor characters such as the smaller eye not filling the ocular lobe as full as in *visendus,* the thicker hand of male gnathopod 2, broader coxa 4, the wider spread of setae on article 5 of pereopods 3–4, the higher number of medial plumes on the inner ramus of uropod 3 and the generally greater armament of uropod 3, the sparser serrations of the epimera, the presence of dorsal serrations on pleonites 2–3 (in contrast to 1–2 in *visendus*) and the dense thick spinules on the telsonic faces.

Distribution.—Belize, Sitee Point and vicinity, on bars with medium fine sand, 0.75–1.2 m.

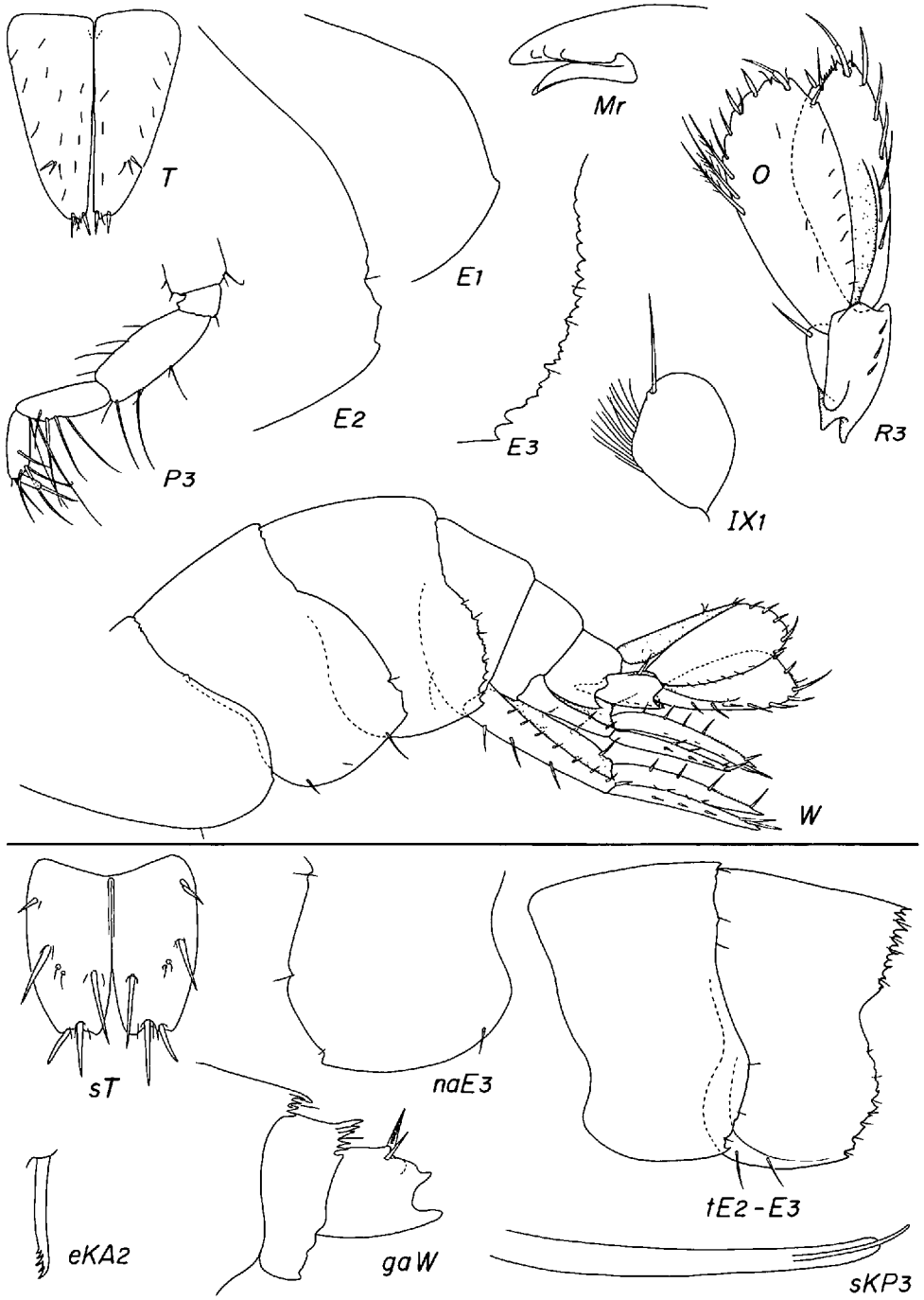

Figure 6. Upper, *Resupinus visendus* new species, male "n". Lower, *Gibberosus myersi* (McKinney), E = female "e"; S = female "s"; ga = female "ga"; na = male "na", t = female "t".

Resupinus visendus (J. L. Barnard) new combination
Figures 5 and 6

Megaluropus visendus J. L. Barnard, 1969: 205–209, figs. 19–20.

Diagnosis.—Eye in either sex not filling entire ocular lobe. No facial setae on epimera 1–3 arranged in vertical sets; notches or serrations on epimeron 3 numerous and deep. Dorsal pleonal serrations present on only segments 1 and 2. Telson lacking numerous small dorsal prickle spines.

Description of Male 2.04 mm.—Ocular lobe barely drooping, eye composed of coffee-colored ommatidia (in alcohol); rostrum pointed. Antenna 1 reaching apex of peduncle on antenna 2, article 2 as long as article 1, article 3 slightly shorter, accessory flagellum 1-articulate, primary flagellum 7-articulate, penultimate article with aesthetasc. Article 4 of antenna 2 about 75% as long as article 5, these articles poorly armed with male setular tufts, flagellum about 1.5 times as long as articles 4–5 of peduncle, multiarticulate and proliferate.

Epistome unproduced, upper lip broadly truncate below, smooth. Right incisor weakly 4-toothed, left 2-toothed, each lacinia mobilis weakly 2-toothed and sharp but left much thicker than right. Right rakers 5, left 5; molar weakly triturative. Palp article 3 about 0.75 times as long as article 3, fairly stout, poorly armed, with 2 facial setae, 4 D-setae and 3 E-setae, palp article 2 with 2 medial and 2 facial setae. Dorsolateral edges of main lobes on lower lip sinuate, inner lobes fleshy, mandibular lobes strong. Inner plate of maxilla 1 with 1 apical seta and cluster or row of medial hair-like setules; outer plate with 11 spines, several bifid or weakly so; palp 2-articulate, with 2 rows of 3 and 5 apical spines, none placed medially, spines diverse. Inner plate of maxilla 2 narrower than outer, face with one seta near outer edge, medial margin with 5 setae in partial pairs. Inner plate of maxilliped with 3 main stout spines but only 1 medial seta; outer plate with large medial cusp spines and 1 thinner apical spine, palp poorly setose laterally, article 4 short, stubby, bearing thick nail of similar length and 2 accessory setae.

Coxae 1–2 broadly truncate and widely setose below, coxa 3 evenly linguiform, rounded and poorly setose below, coxa 4 broad, not sinuate, posterior margin barely concave, setae minute; coxa 5 with anterodorsal lobe pointing forward, poorly developed anteroventral lobe and similar posteroventral lobe; anteroventral lobe of coxa 6 large; setae of coxa 7 divided into anterior and posterior groups of 2 and 4. Gnathopods small, both simple, merus not extended along carpus very far, carpus of gnathopod 1 thick, weakly lobate proximally (not illustrated but slightly weaker than in figure of *R. spinicaudatus*), carpus of gnathopod 2 broadly lobate, triangular, setae confined to distal margin of lobe, hand much thinner than on gnathopod 1 (illustrated and much thinner than in *R. spinicaudatus*).

Pereopods 3–4 alike, article 2 bent basally so as to project in front of coxae and overhead for support while lying on back, setae of article 5 densest but poorly spread, setae of article 6 fewer and confined apically, dactyl stubby and bearing apical seta. Article 2 of pereopods 5–7 pyriform, with posteroventral lobe, anterior bulge weakest on pereopod 7, posterior serrations largest but fewest on pereopod 7. Gills present on coxae 2–7, gill 7 smallest, gill 5 largest.

Only pleonites 1–2 weakly serrate dorsally, epimera 1–3 stongly convex, epimera 2–3 with small posteroventral tooth, epimeron 1 with tooth obsolescent, epimeron 2 poorly serrate (see illustration). Uropods 1–2 lacking interramal tooth, all margins normally spinose. Flat outer face of peduncle on uropod 3 with row of 3

spines, paddle-shaped rami with complex setation as shown in illustration, inner ramus with one large apical seta bearing large basal bulb. Telson cleft to base, each lobe with inconspicuous basoventral seta, dorsal surface densely furnished with small setules, each apex with 2 spines.

Variations.—No other new material of this species available.

Material.—Panama Jones sample 240-1-10, Scout (Culebra) Island, Panama, 15 October 1977, 1.4 m, 84% sand, 12% silty clay, collected by Herbert Kaufmann, young male "n" 2.04 mm (illustrated).

Distribution.—Gulf of California at Bahia de Los Angeles to Pacific Panama, 0–17 m.

Resupinus coloni new species
Figures 7 and 8

Diagnosis.—Eye in either sex filling entire ocular lobe. No facial setae on epimeron 3 arranged in vertical pairs, triads or quartets; notches or serrations on epimeron 3 dense and deep. Dorsal pleonal serrations present on segments 2, 3, 4 and 5. Telson lacking numerous small dorsal prickle spines.

Description of Holotype Male 2.10 mm.—Ocular lobe barely drooping, eye composed of ommatidia surrounded by dense purple-black pigmentary mass (in alcohol); rostrum pointed. Antenna 1 reaching apex of peduncle on antenna 2, article 2 longer than article 1, article 3 scarcely shorter than article 1, accessory flagellum 1-articulate, primary flagellum 8-articulate, 2 articles next to last each with aesthetasc. Article 4 of antenna 2 about 60% as long as article 5, articles 1–3 densely furnished with dorsal male tufts of setules, flagellum greatly elongate and proliferate.

Epistome unproduced, upper lip broadly rounded below, smooth. Right incisor weakly multitoothed (as in *R. visendus*), left 2-toothed, each lacinia mobilis multitoothed and sharp but left much thicker than right. Right rakers 5, left 6; molar weakly triturative. Palp article 3 over 90% as long as article 2, thin, with 2 facial setae, 9 D-setae, 3 E-setae, article 2 with 6 medial and 3 facial setae. Dorsolateral edges of main lobes on lower lip sinuate, inner lobes fleshy, mandibular lobes strong. Inner plate of maxilla 1 with 1 apical seta and cluster or row of medial hair-like setules; outer plate with eleven spines, several bifid or weakly so; palp 2-articulate, with 2 rows of 4 and 6–7 apical spines, 2 spines of long row placed medially, spines diverse. Inner plate of maxilla 2 narrower than outer, face with one seta in row near outer edge, medial margin with 5 setae in partial pairs. Inner plate of maxilliped with 3 main stout spines but only 1 medial seta; outer plate with large medial cusp spines and 2 thinner apical spines, palp poorly setose laterally, article 4 short, stubby, bearing thick nail of similar length and 2 accessory setae.

Coxae 1–2 broadly truncate and widely setose below, coxa 3 evenly linguiform, rounded and setose below, coxa 4 broad, poorly sinuate, posterior margin barely concave, setae minute; coxa 5 with anterodorsal lobe pointing forward, poorly developed anteroventral lobe and slightly larger posteroventral lobe; anteroventral lobe of coxa 6 large; setae of coxa 7 divided into anterior and posterior groups of 2 and 2. Gnathopods small, both simple, merus not extended along carpus very far, carpus of gnathopod 1 thick, weakly lobate proximally, carpus of gnathopod 2 broadly lobate, triangular, setae confined to distal margin of lobe, hand much broader than on gnathopod 1.

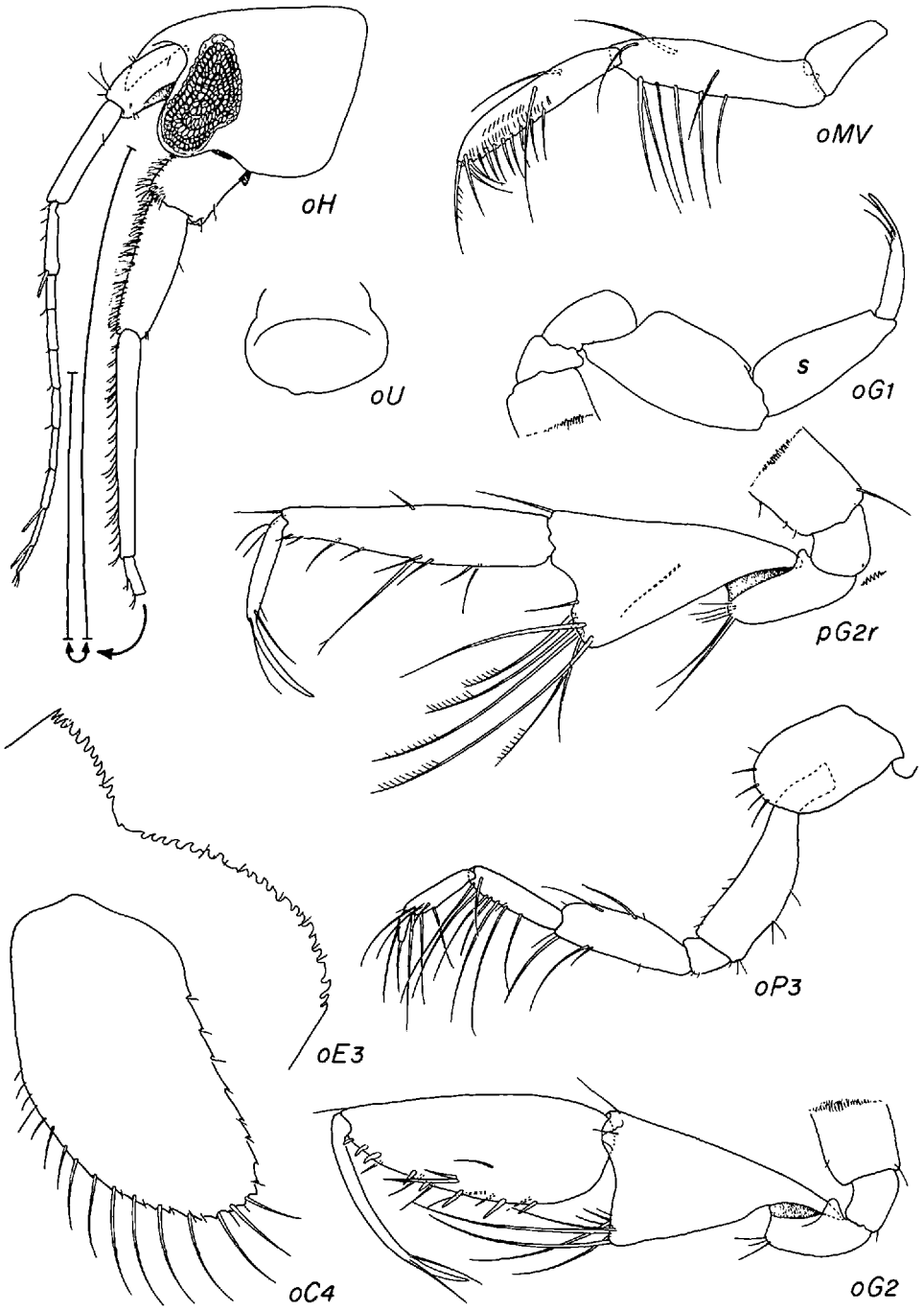

Figure 7. *Resupinus coloni* new species, o = male "o", p = female "p".

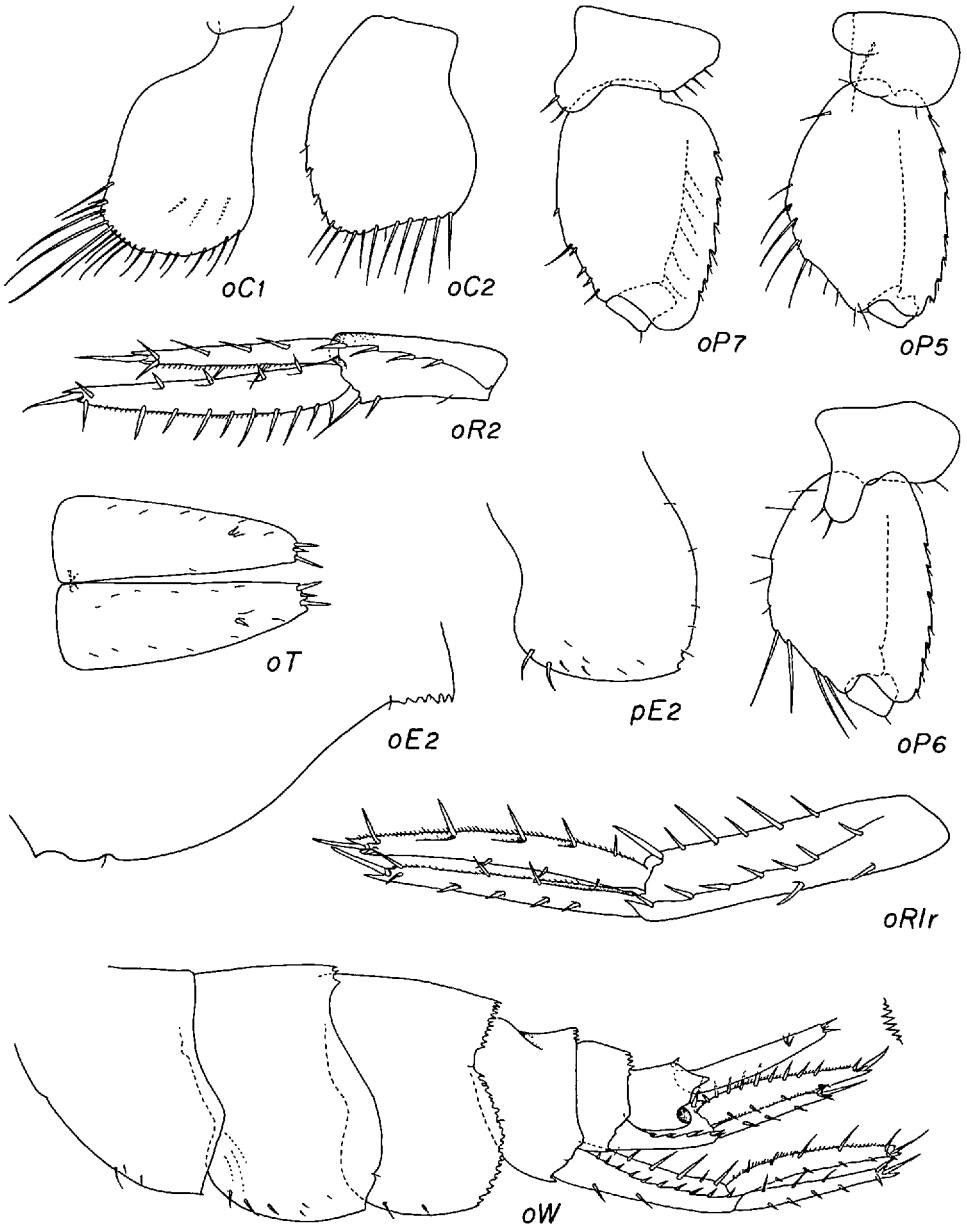

Figure 8. *Resupinus coloni* new species, o = male "o", p = female "p".

Pereopods 3–4 alike, article 2 bent basally so as to project in front of coxae and overhead for support while lying on back, setae of article 5 densest and moderately spread, setae of article 6 fewer and confined apically, dactyl stubby and bearing apical seta. Article 2 of pereopods 5–7 pyriform, with posteroventral lobe, anterior bulge weakest on pereopod 7, posterior serrations not distinctive on pereopod 7. Gills present on coxae 2–7, gill 7 smallest (even smaller than in *R. spinicaudatus*), gill 5 largest.

Pleonites 2–5 serrate dorsally, epimera 1–3 with strong convexity, epimera 1–

3 with small posteroventral tooth, epimeron 2 poorly serrate. Uropods 1–2 lacking interramal tooth, all margins normally spinose. [Uropod 3 unknown, therefore flat outer face of peduncle on uropod 3 with row of ?spines, ?paddle-shaped rami with complex setation, inner ramus with ?2 large apical setae bearing large basal bulbs.] Telson cleft to base, each lobe with inconspicuous basoventral seta, dorsal surface densely furnished with small setules, each apex with 3 spines.

Female "p" 2.09 mm.—Like male but in many places much more setose (in a few places much less setose): Main differences, rostrum, eyes scarcely, and pleopods smaller, antenna 2 much shorter and peduncle lacking dense anterior tufts of setules; gnathopod 1 like male, gnathopod 2 wrist similar to male but hand very thin and elongate, palm and posterior margin of hand continuous, lined with sparse setae, dactyl long, slender, smooth except for 2 subapical facial setae.

Minor differences from male: Flagellum of antenna 1 with 8 articles [antenna 2 missing]. Right and left rakers 5 and 6, D and E setae 6 and 3. Coxae 1–4 much more setose than in male, for example, coxae 1–2 with 22 and 16 long setae, 10 and 12 short setae, coxa 4 with 15 posterior setules, coxa 5 with long facial setae added in dots to male coxa 5 illustrated. Article 5 of pereopods 3–4 with only 5 and 5 posterior long setae, posterior serrations on article 2 of pereopods 5–7 = 15-14-11, anterior armaments (spines, setae, setules) = 23-26-25. Epimeron 1 with 2 ventral and 4 facial setules, epimeron 2 with 3 posterofacial setae in tandem and 2 anteroventral marginal spines; epimeron 3 with 3 facial setae in group, posterior setule notches on epimera 2 and 3 = 2 and many. Uropod 1 peduncle with 3 ventral spines. [Uropod 3 missing.]

Brood plates small, thin, on coxae 2–5, setal formulas, apical = 2-2-2-2, anterior = 3-1-0-1, posterior = 1-1-1-1, anterior setules = 0-5-5-7, posterior setules = 1-1-1-1.

Variations.—Female "u" 2.38 mm analyzed to obtain missing antenna 2: like normal female *Megaluropus,* poorly setose, ratio of articles 4, 5, and flagellum = 11-17-32, flagellum with 12 articles.

Holotype.—USNM 195134, male "o" 2.10 mm (illustrated).

Type-locality.—Panama Jones sample 240-1-10, Panama, Scout (Culebra) Island, 15 October 1977, 1.4 m, 84% sand, 12% silty clay, collected by Herbert Kaufmann.

Material.—The type-locality, female "p" 2.09 mm (illustrated). Panama Jones 182-1B, Pilot House Beach, Naos Island, Panama, 08°55′30″N, 79°32′15″W, 1.3 m, 9 March 1974, coll. Herbert Kaufmann, ovigerous female "u" 2.38 mm (described); 182-1P, same locality and data, female "t" 2.27 mm; 183-2, beach on Scout (Culebra) Island, Panama, 08°54′45″N, 79°31′55″W, broken young male "v" 1.50 mm; Panama Jones 183-2, same data, 2 specimens; Panama Jones 239-1-7, Scout Island, Panama, 1.4 m, 1 August 1977, 76% clay, 18% sand, collected by Herbert Kaufmann, 1 male. Allan Hancock Foundation VELERO III 459-35, Playa Blanca, Costa Rica, off rocky beach, algae and rock, 2–3 fm, 8 February 1935, coll. W. L. Schmitt, 5 specimens, =USNM Acc. 131571; 460-35, same locality and date, middle of bay, 3–5 fm, mud, sand, algae, 15 specimens; 481-35, Salinas Bay, Costa Rica, off end of island toward rock to west, coarse sand, 6 fm, 11 February 1935 (above 3 samples originally deposited as *Magaluropus parvus* Shoemaker new species = nomen nudum). Allan Hancock Foundation VELERO III 381-35, Independencia Bay Peru, 5 fm, 14 June 1935, USNM Acc. No. 131571 (1 female) (identified as *Magaluropus breviramus* Shoemaker new species = nomen nudum).

Relationship.—This species differs from its congeners in the dorsal serrations being present on pleonites 4–5. Female gnathopod 2 hand is generally much thinner than in the other two species of the genus. Like *R. visendus* but unlike *R. spinicaudatus,* the telson has no thick dorsal spines on the faces but does have very thin setules.

Distribution.—Pacific, Panama, to Costa Rica, 0–9 m.

Gibberosus new genus

Diagnosis.—Rostrum short. Ocular lobe of head with sharp angle or cusp. Accessory flagellum 2-articulate. Maxillae well setose medially. Merus of gnathopod 2 with large distal lobe often produced along or underriding carpus. Peduncle of uropod 1 with interramal tooth. Spines on telson large or long.

Description.—One or more thick spines present on antennae 1–2, especially on antenna 1 articles 1–2 and antenna 2 articles 3–4. Upper lip notched below from anterior view. Mandibular lobes of lower lip with facial extensions pointing axially. Inner plate of maxilla 1 very leaf-like and with apicolateral pointed extension. Inner plate of maxilla 2 broader than outer. Coxae 1–2 rounded below. Coxa 4 tapering. Coxa 5 without anterodorsal lobe. Pleonite 6 with large dorsal spines in transverse row. Telson never with numerous small dorsal prickle spines.

Variables.—Cusp on head becoming vestigial but sharpness of corner determinable; armaments on flagellum of antenna 2 long, thin, relatively simple, or short, thick and serrate; spines on pereopods 3–5 simple or hooded or clavate; armaments on articles 5–6 of pereopods 3–4 either spines or setae; article 6 of pereopod 7 multisegmented in 2 species, unknown in other species; dorsal serrations of pleonites often reduced, especially in tandem effect, thus pleonite 2 serrations absent, then pleonites 3 and 4, with pleonite 5 serrations reduced; dorsal spines on pleonite 5 present or absent; ventral setae of epimeron 1 usually about 9–12 but in large-bodied demes increasing to 25–45; ventrofacial spines on epimera 2–3 present or absent, or represented only by setules, generally anteriormost spine enlarged, but next spines variable, long, medium or short or setular in form; posterior serrations of epimera 1–2 generally weak, occasionally well developed on epimeron 2, present, absent or of intermediate forms on epimeron 3, usually all epimera with sharp posteroventral tooth; basofacial spines on peduncle of uropod 1 variable, usually forming rank of increasing elongate and thin spines, last spine elongate, or last spine short or last 2 spines short relative to one or more anterior spines; peduncle of uropod 3 with or without basofacial spines; rami of uropod 3 broad or narrow, with few large basal spines or with fully spinose perimeters; dorsal spines of telson present or absent, large, variable in position.

Etymology.—Named for the lobe on the merus of gnathopod 2.

Type-species.—*Megaluropus myersi* McKinney, 1980.

Composition.—*Megaluropus* [*longimerus*] *falciformis* J. L. Barnard, 1969 (Gulf of California); *Megaluropus longimerus* Schellenberg, 1925 (Nigeria) (also reported from California by J. L. Barnard, 1962 but now reidentified as *G. myersi*); *Gibberosus devaneyi* new species (California).

Remarks.—Unfortunately, poor writing by Barnard (1969: 205, item 2 under Relationship of *Megaluropus longimerus falciformis*) led McKinney to think that the ocular lobe of the head was rounded or lacked a sharp angle of any sort, whereas Barnard intended to make a distinction between a sharp angle at the ocular corner and a sharp angle sitting on a cusp extended outward from the lobe. This then led to the establishment of *M. myersi* on the presence of a sharp angle in contrast to the roundness of Californian *M. longimerus* (now concluded also to be *myersi*). Both species have an angle, though the angle of *M. myersi* and of *M. falciformis* (the original contrastor) is situated on a cusp extended out from the ocular lobe. This is also the situation as described by Schellenberg (1925) for the original Nigerian *M. longimerus*.

KEY TO THE SPECIES OF *GIBBEROSUS*

1a. Epimeron 3 not serrate, perimeters of rami on uropod 3 fully spinose ..... *devaneyi* new species
1b. Epimeron 3 serrate, perimeters of rami on uropod 3 poorly spinose 2
2a. Epimeron 3 poorly serrate ..... *falciformis*
2b. Epimeron 3 deeply or densely serrate 3
3a. Pereopod 5 with clavate spines, pereopods 3–4 with hooded spines, armaments on flagellum of antenna 2 thin and simple, peduncle of uropod 3 lacking facial spines ..... *longimerus*
3b. Pereopod 5 with pointed spines, pereopods 3–4 with simple spines, armaments on flagellum of antenna 2 thick and serrate, peduncle of uropod 3 bearing facial spines ..... *myersi*, continue to couplet 4 for demic analysis
4a. Pleonite 2 serrate dorsally ..... Yucatan (types) and Keys *myersi*
4b. Pleonite 2 not serrate dorsally, with 2 setule notches only 5
5a. Pleonite 5 with 2 dorsal spines ..... Tobago and Grenadines
5b. Pleonite 5 lacking dorsal spines 6
6a. Posteriormost facial spine on peduncle of uropod 1 short and thick ..... Panama
6b. Posteriormost facial spine on peduncle of uropod 1 long and thin 7
7a. Epimeron 2 with facial spines ..... females from Oregon, S. California, Baja California, Brazil and males from Coronados
7b. Epimeron 2 without facial spines ..... females from Brazil, Peru, Costa Rica, Queen Charlotte, Coronados and most males except Coronados

Gibberosus longimerus (Schellenberg) new combination
Figures 9–11

Megaluropus longimerus Schellenberg, 1925: 151–153, fig. 14 (not J. L. Barnard, 1962).

Diagnosis.—Spines on pereopods 3–4 hooded. Pleonite 2 not strongly serrate; pleonite 5 dorsally serrate and with 2 dorsal spines. Distalmost ventrolateral facial spine on peduncle of uropod 1 elongate. Epimeron 3 strongly serrate. Basofacial spines on peduncle of uropod 3 absent. Telson with dorsal spines besides apical spines.

Description of Lectotype Female "a" 6.13 mm.—Ocular lobe not drooping, with sharp anterodistal cusp, eye composed of closely packed large ommatidia clear of black-purple pigmentary stain (in alcohol); rostrum short and sharp. Antenna 1 barely exceeding apex of peduncle on antenna 2, article 1 with stout apicoventral and apicolateral spine, article 2 almost as long as article 1, with weak apicomedial subacute protrusion, article 3 much shorter, accessory flagellum 2-articulate, primary flagellum 10-articulate, one aesthetasc present each on articles 5–9; ratio of articles 1, 2, 3 and flagellum = 30-28-9-74. Article 3 of antenna 2 with 3 small facial apicolateral spines, article 4 shorter than article 5, flagellum [assumed to be much longer than articles 3–5 of peduncle]; [ratio of articles 3–5 and flagellum = unknown].

Epistome unproduced, upper lip deeply notched below, one lobe weakly scaled. Right incisor 6-toothed, left 3-toothed, right lacinia mobilis irregularly 4-toothed, left much broader and 4-toothed. Right and left rakers 20+; molar strongly triturative (short plumose seta not detected). Palp article 1 elongate, almost 40% as long as article 2, latter with 14 diverse medial setae, article 3 about 73% as long as article 2, weakly expanded, with 2 facial setae, D setae = 11, E setae = 4. Dorsolateral edges of main lobes on lower lip weakly sinuate, inner lobes fleshy, mandibular lobes strong, with facial extensions (towards observer). Inner plate of maxilla 1 leaf-like, very expanded, with 1 large seta on nipple-like apicolateral extension, with 13 long medial setae and cluster or row of medial hair-like setules; outer plate with eleven spines, many bifid or multiserrate; palp 2-articulate, both

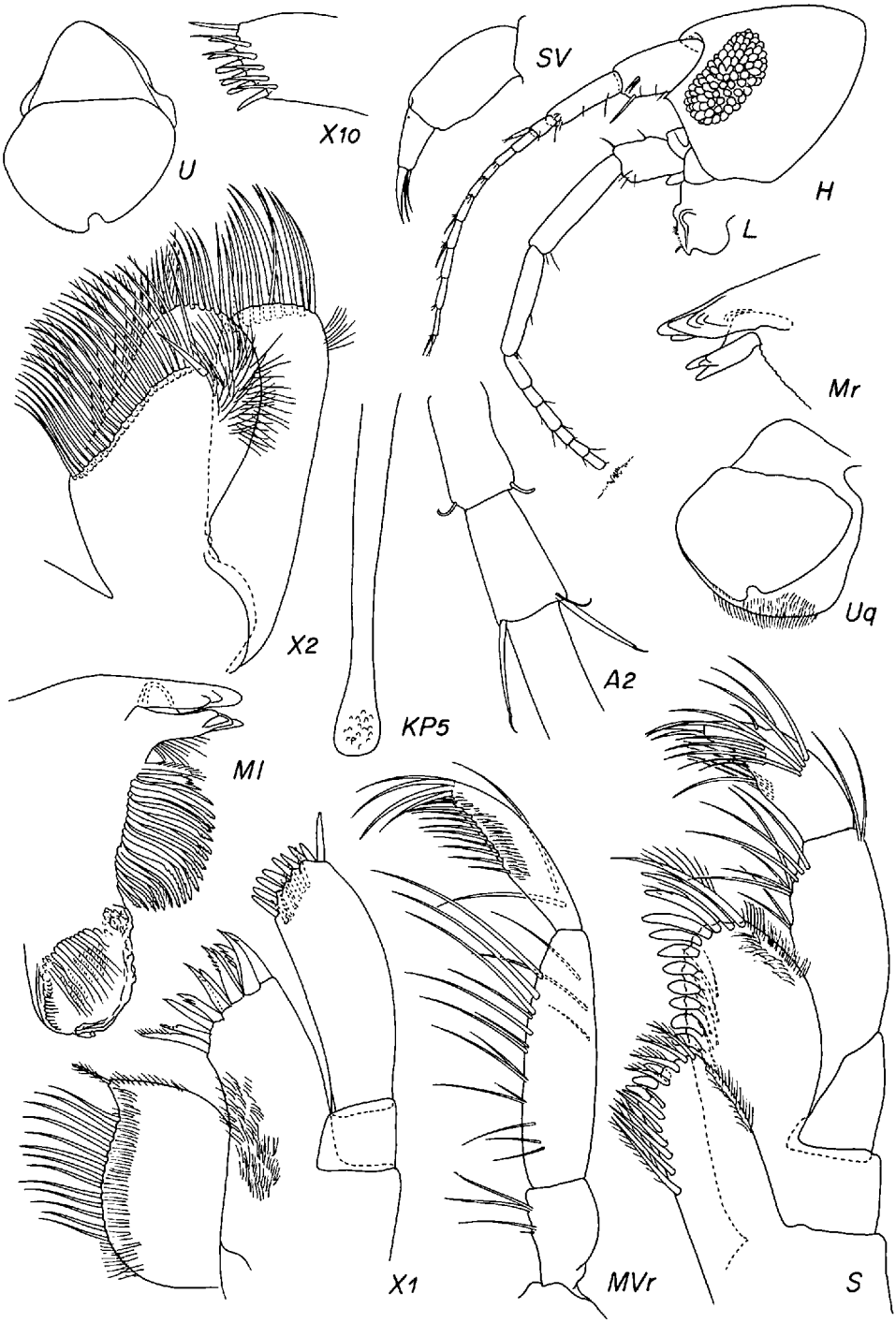

Figure 9. *Gibberosus longimerus* (Schellenberg), holotype, female "a".

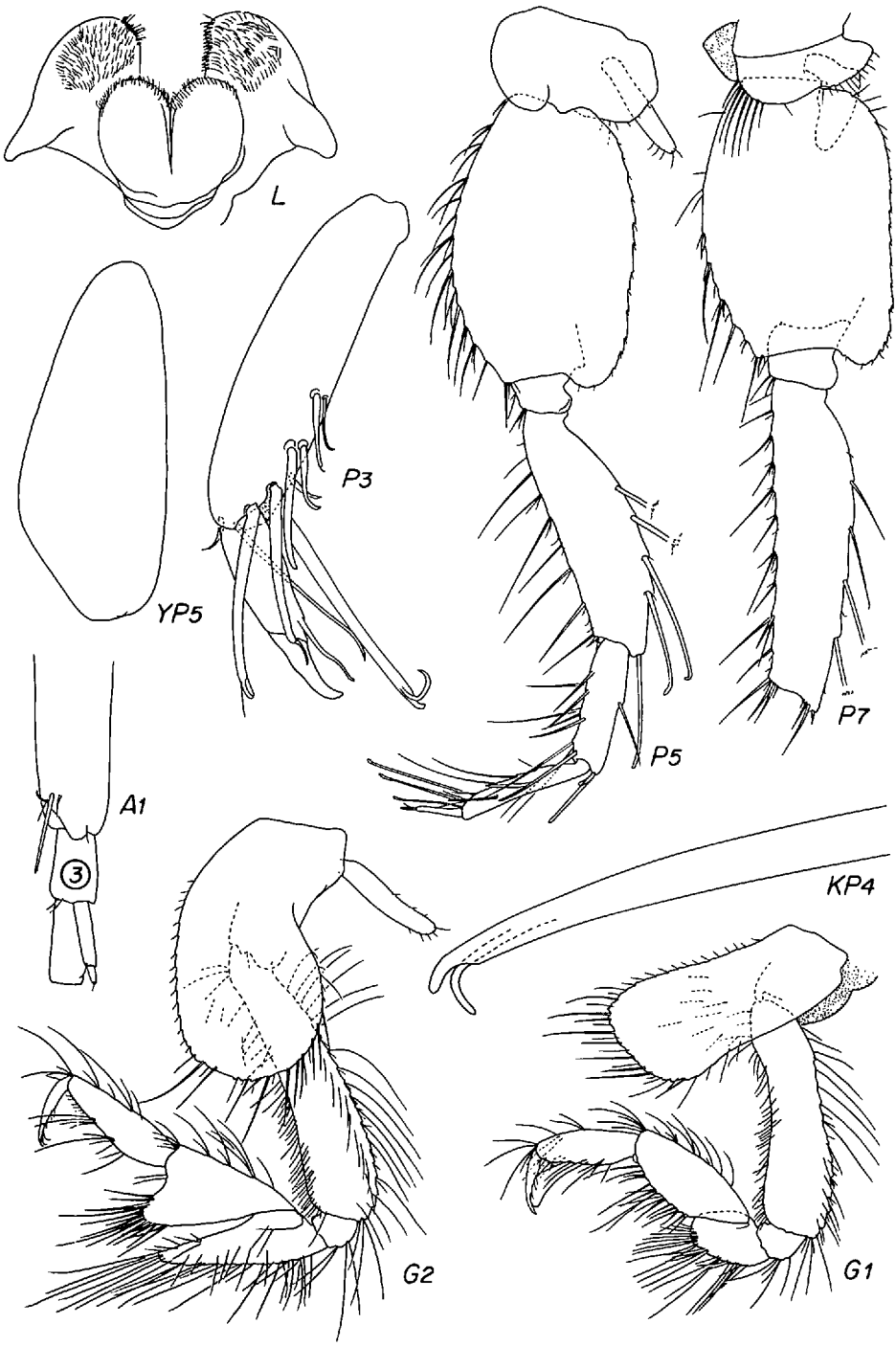

Figure 10. *Gibberosus longimerus* (Schellenberg), holotype, female "a".

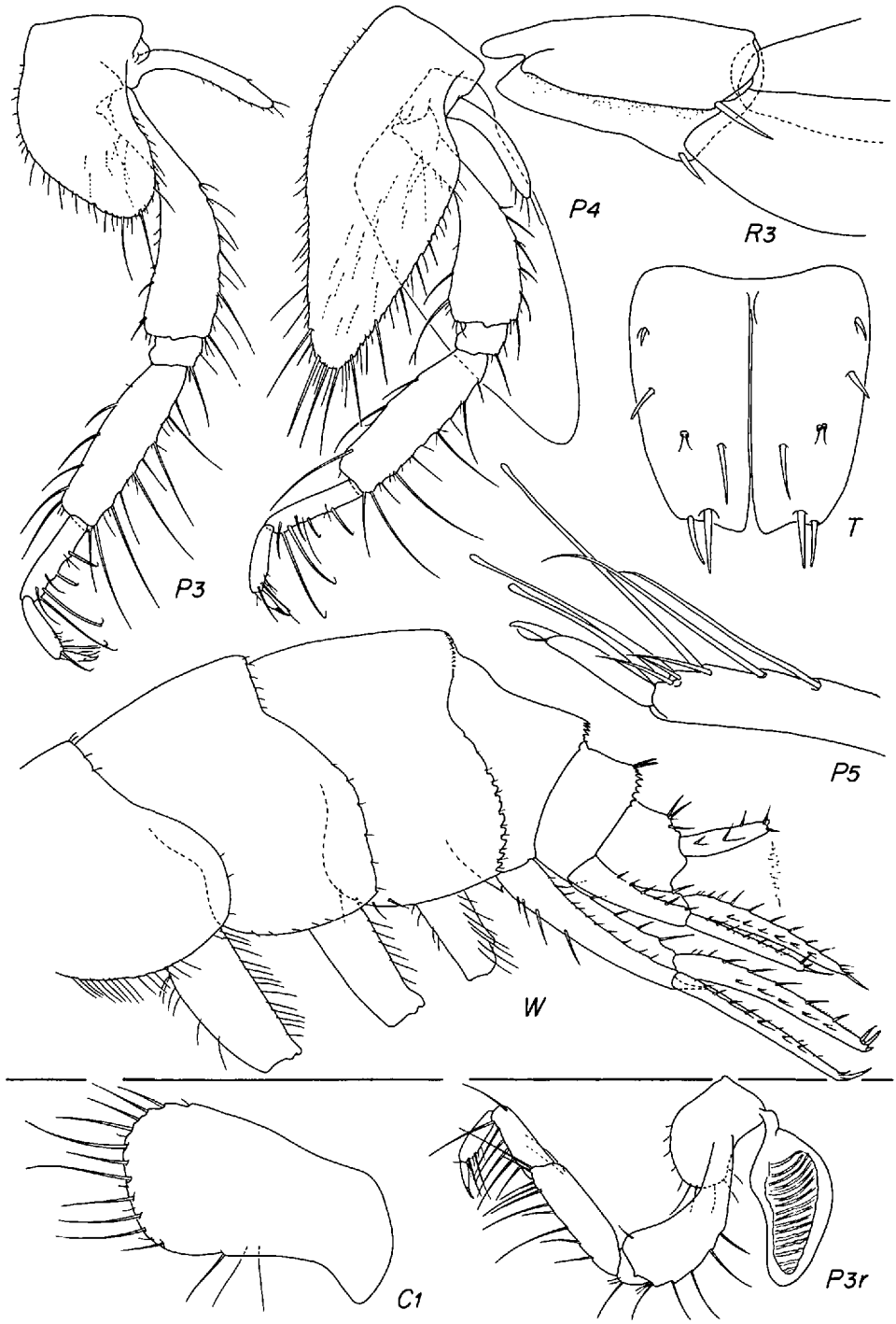

Figure 11. Upper, *Gibberosus longimerus* (Schellenberg), holotype, female "a". Lower, *G. devaneyi* new species, holotype male "a".

sides symmetrical, with 2 rows of 7–8 thick and 5–6 thin apical spines, none medially, spines diverse. Inner plate of maxilla 2 broader than outer, face with 26-seta row, medial margin also setose. Inner plate of maxilliped with 3 very stout main spines, 5 medial setae, 6 other apical setae; outer plate with 6 large very ovate medial cusp spines and 5 thinner apical spines, palp poorly setose laterally, article 4 short, stubby, bearing thick nail of similar length and 2 accessory setae.

Coxae 1–2 broadly rounded and widely setose below, coxa 3 bent-linguiform, rounded and setose below, coxa 4 tapering almost evenly, only posterodorsal margin excavate, lower posterior margin not concave; coxae 1–4 with many minute setae not counted below, with setae as follows: coxa 1 with 9 long and 6 short setae, coxa 2 with 9 long and 8 small spine-like setae, coxa 3 with 3 long and 11 small setae, coxa 4 with 14 larger setae and 12 shorter setae besides uncounted numerous tiny setae on all coxae; coxa 5 without anterodorsal lobe pointing forward, bearing weak anteroventral lobe without setules, posterior lobe with 6 setules; anteroventral lobe of coxa 6 ordinary, with 10 setules, posterior lobe with 8–9; setae of coxa 7 divided into anterior and posterior groups of 8 and 12. Gnathopods small, both simple, carpus of gnathopod 1 ovate, not lobate, carpus of gnathopod 2 lobate posterodistally, triangular, setae widespread, not confined to distal margin of lobe, hand scarcely thicker than on gnathopod 1, merus strongly lobate and underriding carpus along posterior margin, this metacarpal lobe strongly setose.

Pereopods 3–4 alike, article 2 bent basally so as to project in front of coxae and overhead for support while lying on back, spines and setae of article 5 densest and widely spread, not clavate, main spines and setae of article 6 six and 5 respectively, and confined apically, dactyl stubby and bearing sharp, curved apical spine. Article 2 of pereopods 5–7 weakly pyriform, with posteroventral lobe, anterior bulge weakest on pereopod 7, posterior serrations equally small on these articles; anterior armaments on article 2 of pereopods 5–7 diverse, posterior serrations = numerous, article 2 of pereopod 7 without stouter closely packed posterodorsal setal serrations [article 6 segmentation unknown, this article absent]. Gills present on coxae 2–7, gill 7 smallest (but of medium size and much larger than in *Resupinus*), gill 4 largest but gill 3 almost as large; brood plates small, thin, on coxae 2–5.

Pleopods 1 and 2 with sharp posterolateral corner on peduncle as in other species of group. Pleonites 3–5 serrate dorsally, pleonite 5 with 2 dorsal spines, pleonite 6 with 4 dorsal spines in tandem side to side, epimera 1–3 with strong convexity, epimera 2–3 with small posteroventral tooth, epimeron 1 with 1 posteroventral and 2 posterior setules, epimeron 2 with 5 posterior setule notches not including tooth, epimeron 3 well serrate posteriorly; epimeron 1 with many thin setae ventrally, epimeron 2 with 5 ventral setules, epimeron 3 with 1 long anteroventral spine and 1 short ventrofacial spine in tandem. Uropod 1 bearing interramal tooth, all margins of uropods 1–2 normally spinose, ventrofacial margin of peduncle on uropod 1 with anterior-posterior spine formula of S-L-L-L (L = long, S = short). Flat outer face of peduncle on uropod 3 lacking spines, inner and outer (dorsal) apices with one spine, rami [missing, ?paddle-shaped, assumed to be of broad form, outer with ?3 inner basal spines, outer with ?4 outer basal spines, outer margin of inner ramus with ?1 spinule, inner margin of outer ramus with ?5 spinules, each apex with ?bulbar spine, margins otherwise ?sparsely setule-serrate]. Telson cleft to base, dorsal surface with 3 small to large spines in even pattern, plus pair of setules at M.60, each apex with 2 spines.

Lectotype.—Zoologisches Museum, Universitat Hamburg, K 10589 TYPE, lec-

totype, newly selected, young female "a" 6.13 mm, illustrated, pereopod 6 and rami of uropod 3 missing; paralectotype young female "b" 5.21 mm.

Distribution.—Nigeria, Lagos.

Gibberosus falciformis (J. L. Barnard) new combination

Megaluropus longimerus falciformis J. L. Barnard, 1969: 205, figs. 17, 18.

Diagnosis.—Spines on pereopods 3–4 clavate. Pleonite 2 not dorsally serrate; pleonite 5 serrate but spineless. Epimeron 3 poorly serrate, with about 6 subequal setule notches. Basofacial spines on peduncle of uropod 3 [?present]. Telson with only apical spines.

Note.—We have reinvestigated type-material of *G. falciformis* to observe the following characters: size of teeth on pleonites 2 = 0, 3 = small, 4 = small, 5 = large to medium; spines on pleonites 5 = 0, 6 = 4–5; spines or setae on epimera 2 = ss, 3 = Ls. Basofacial spines on peduncle of uropod 3 = [missing on available material].

Distribution.—Gulf of California, Bahia de Los Angeles, 2 m.

Gibberosus myersi (McKinney) new combination
Figures 6 and 12

Megaluropus longimerus J. L. Barnard, 1962: 103, figs. 20, 21; 1969: fig. 17o, p, q (not Schellenberg, 1925).
Megaluropus myersi McKinney, 1980: 93, figs. 5–7.

Diagnosis.—Spines on pereopods 3–4 not clavate nor hooded. Pleonite 2 dorsally serrate or not; pleonite 5 serrate and bearing 0–2 spines. Epimeron 3 strongly serrate. Peduncle of uropod 3 with lateral facial spines. Basofacial spines on peduncle of uropod 3 present (on ridge). Telson with dorsal spines besides apical spines.

Description of Female "s" 3.16 mm, Looe Key Reef, Florida Keys.—Ocular lobe not drooping, with sharp anterodistal cusp, eye composed of closely packed large ommatidia clear of black-purple pigmentary stain (in alcohol); rostrum short and blunt. Antenna 1 exceeding apex of peduncle on antenna 2, article 1 with stout apicodorsal and apicolateral spine, article 2 as large as article 1, with weak apicomedial subacute protrusion, article 3 much shorter, accessory flagellum 2-articulate, primary flagellum 11–12-articulate, one aesthetasc present each on articles 9–10; ratio of articles 1, 2, 3 and flagellum = 62-72-36-244. Article 3 of antenna 2 with facial apicolateral spine, article 4 of antenna 2 almost as long as article 5, flagellum much longer than articles 3–5 of peduncle, 14-articulate, ratio of articles 3–5 and flagellum = 50-120-134-320.

Epistome unproduced, upper lip deeply notched below, lobes weakly scaled. Right incisor 6-toothed, left 5-toothed, right lacinia mobilis irregularly 4-toothed, left much broader and 4-toothed. Right rakers 8, left 10; molar strongly triturative, bearing short plumose seta. Palp article 1 elongate, about 40% as long as article 2, latter with 8 diverse medial setae, article 3 about 77% as long as article 2, weakly expanded, with 2 facial setae, D setae = 7, E setae = 3. Dorsolateral edges of main lobes on lower lip weakly sinuate, inner lobes fleshy, mandibular lobes strong, with facial extensions (towards observer). Inner plate of maxilla 1 leaf-like, very expanded, with 2 tiny setae on nipple-like apicolateral extension and

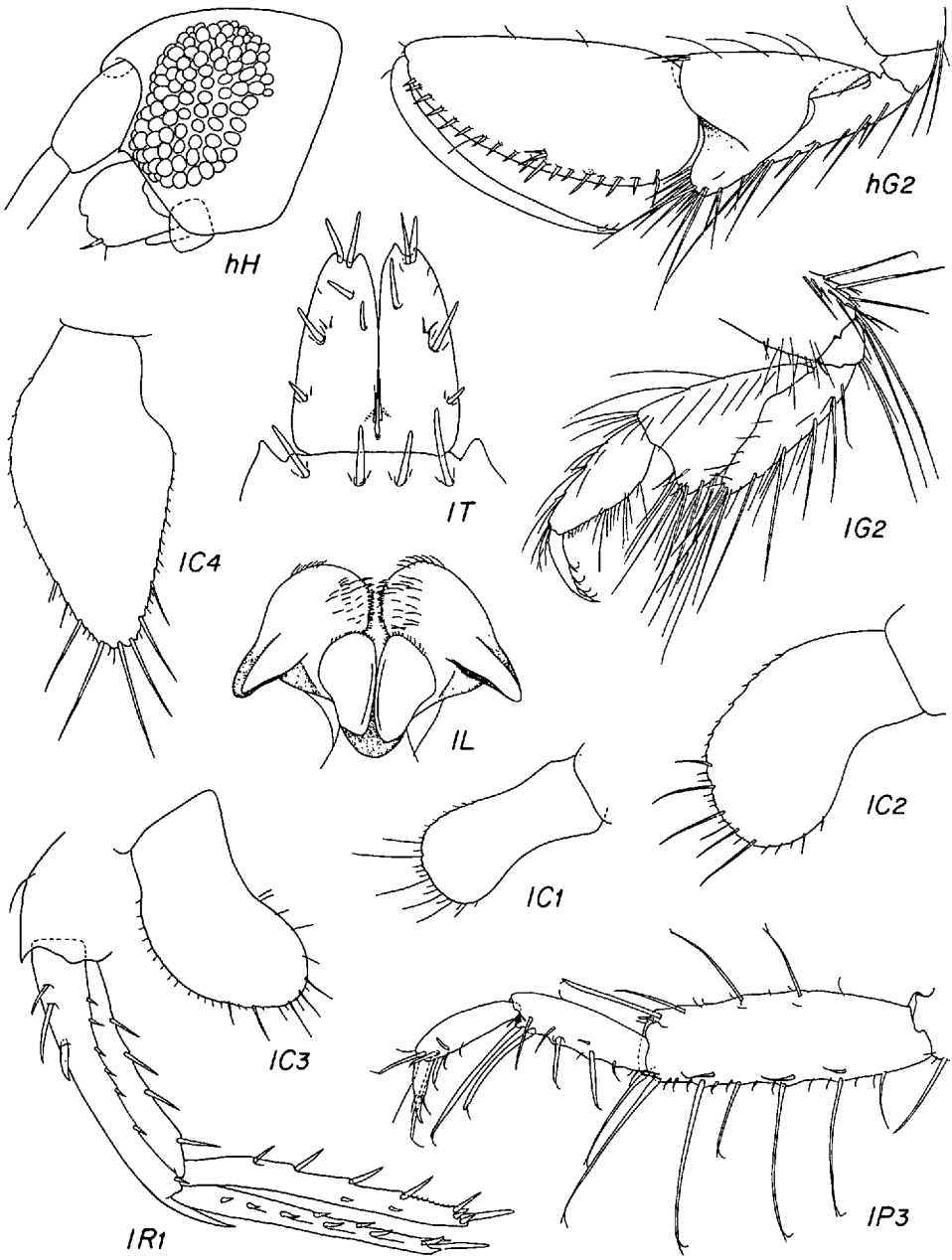

Figure 12. *Gibberosus myersi*, h = male "h", L = female "L".

10 long setae on rounded apicomedial margin and cluster or row of medial hair-like setules; outer plate with eleven spines, many bifid or multiserrate; palp 2-articulate, both sides symmetrical, with 2 rows of 7 thick and 4 thin apical spines, none medially, spines diverse. Inner plate of maxilla 2 slightly broader than outer, face with 20-seta row, medial margin also setose. Inner plate of maxilliped with 3 main very stout spines, 5 medial setae, 4 other apical setae; outer plate with 6

large very ovate medial cusp spines and 4 thinner apical spines, palp poorly setose laterally, article 4 short, stubby, bearing thick nail of similar length and 3 accessory setae.

Coxae 1–2 broadly rounded and widely setose below, coxa 3 bent-linguiform, rounded and setose below, coxa 4 tapering almost evenly, only posterodorsal margin excavate, lower posterior margin not concave; coxae 1–4 with many minute setae not counted below, with long setae as follows: coxa 1 with 7 long and 6 short, coxa 2 with 6 large and 5 small spine-like setae, coxa 3 with 1 large and 3 small setae, coxa 4 with 8 larger setae and 5 shorter setae besides uncounted numerous tiny setae on all coxae; coxa 5 without anterodorsal lobe pointing forward, bearing weak anteroventral lobe with 6 setules, posterior lobe with 3 setules; anteroventral lobe of coxa 6 ordinary, with 5 setules, posterior lobe with 3; setae of coxa 7 divided into anterior and posterior groups of 5 and 7. Gnathopods small, both simple, carpus of gnathopod 1 ovate, not lobate, carpus of gnathopod 2 lobate posterodistally, triangular, setae widespread, not confined to distal margin of lobe, hand scarcely thicker than on gnathopod 1, merus strongly lobate and underriding carpus along posterior margin, this metacarpal lobe strongly setose.

Pereopods 3–4 alike, article 2 bent basally so as to project in front of coxae and overhead for support while lying on back, spines and setae of article 5 densest and widely spread, not clavate, main spines and setae of article 6 five and 6 respectively, and confined apically, dactyl stubby and bearing sharp, curved apical spine. Article 2 of pereopods 5–7 pyriform, with posteroventral lobe, anterior bulge weakest on pereopod 7, posterior serrations largest but fewest on pereopod 7; anterior armaments on article 2 of pereopods 5–7 diverse, posterior serrations = 12-10-9, article 2 of pereopod 7 with 5 stouter closely packed posterodorsal setal serrations (not included in count above); article 6 multisegmented. Gills present on coxae 2–7, gill 7 smallest (but of medium size and much larger than in *Resupinus*), gill 4 largest; brood plates small, thin, on coxae 2–5.

Pleonites 2–5 serrate dorsally, pleonite 5 with 1 (normally 2) dorsal spines, pleonite 6 with 5 (normally 4) dorsal spines in tandem side to side, epimera 1–3 with strong convexity, each with small posteroventral tooth, epimeron 1 with posteroventral and 1 posterior notches, epimeron 2 with 4 posterior setule notches including tooth, epimeron 3 well serrate posteriorly; epimeron 1 with 9 thin setae ventrally, epimeron 2 with one facial setule (no spines as in type-material from Yucatan), epimeron 3 with 1 long anteroventral spine and 1 short ventrofacial spine in tandem. Uropod 1 bearing interramal tooth, all margins of uropods 1–2 normally spinose, ventrofacial margin of peduncle on uropod 1 with anterior-posterior spine formula of S-L-L (L = long, S = short). Flat outer face of peduncle on uropod 3 with row of 4 spines, inner (dorsal) apex with one spine, rami broadly paddle-shaped, outer with 3 inner basal spines, outer with 4 outer basal spines, outer margin of inner ramus with 1 spinule, inner margin of outer ramus with 5 spinules, each apex with bulbar spine, margins otherwise sparsely setule-serrate. Telson cleft to base, each lobe with inconspicuous basoventral seta, dorsal surface with 3–4 small to large spines in uneven pattern, each apex with 2 spines (see figure) and 3 setules.

Remarks.—Males generally lose many spines on epimera 2–3, uropod 3 and pleonites 5–6 during maturation.

Description of Female "L" from Pacific Panama 3.89 mm.—Antenna 1 primary flagellum 12-articulate, one aesthetasc present each on articles 4, 5, 6, 7, 8, 10, 11; ratio of articles 1, 2, 3 and flagellum = 70-62-26-265. Right incisor 6-toothed, left 6+-toothed, right lacinia mobilis irregularly 8-toothed, left much broader and

4-toothed. Right rakers 9 + 2 rudimentary, left 10. Palp article 2 with 12 diverse medial setae, article 3 about 77% as long as article 2, weakly expanded, with 3 facial setae, D setae = 6, E setae = 4. Inner plate of maxilla 1 with 9 long setae on rounded apicomedial margin; palp with 2 rows of 7 thick and 4 thin apical spines. Inner plate of maxilliped with 5 medial setae, 5 other apical setae; outer plate with 5 large very ovate medial cusp spines and 4 thinner apical spines. Coxae 1–4 with many minute setae, long setae as follows: coxa 1 with 5 long and 2 short, coxa 2 with 6 large and 2 small spine-like setae, coxa 3 with 10 small setae, coxa 4 with 8 larger setae; coxa 5 anteroventral lobe with 3 setules, posterior lobe with 2 setules; anteroventral lobe of coxa 6 with 5 setules, posterior lobe with 2; setae of coxa 7 divided into anterior and posterior groups of 5–6 and 3. Anterior armaments on article 2 of pereopods 5–7 diverse, = 16-19-18, posterior serrations = 19-15-13, article 2 of pereopod 7 with 2 stouter but not closely packed postero-dorsal spine-serrations (included in count above). Oostegite setal formulas, apical = 3-?-2-3, anterior = 5-?-8-7, posterior = 2-?-3-6, posterior setules = 3-?-2-2, anterior setules = 0.

Pleonites 3–5 serrate dorsally, pleonite 6 with 4 dorsal spines in tandem side to side, epimeron 1 with posteroventral and posterior notch, epimeron 2 with 3 posterior setule notches including tooth; epimeron 1 with 9 thin setae and spines ventrally, epimeron 2 lacking spines, epimeron 3 with 1–2 long anteroventral spines and 1–2 short ventrofacial spines in tandem. Ventrofacial margin of peduncle on uropod 1 with anterior-posterior spine formula of L-L-S (L = long, S = short). Uropod 3 [missing]. Each lobe of telson with inconspicuous basoventral seta, dorsal surface with 4 large spines in uneven pattern, each apex with 2 spines.

Male "h" from Panama 3.09 mm.—Like female, rostrum similar, eyes larger, pleopods larger, antenna 2 [missing but from literature much longer and peduncle bearing dense anterior tufts of setules]; antenna 1 like female, flagellum with 16 articles; gnathopod 1 like female, both palmer margins with fine comb; gnathopod 2 enlarged, wrist larger than in female, dominating merus more, hand elongate, almond-shaped, palm and posterior margin of hand continuous, lined throughout with short spines, dactyl long, slender, smooth except for 2 subapical facial setae. Epimeron 1 with 9 ventral setae, posteroventral tooth and no posterior serrations, epimeron 2 lacking facial setae, posteroventral tooth and 4 widely spaced posterior notches, epimeron 3 with 1 anteroventral large spine, 1 posteroventral small spine on face, dense posterior serrations. Peduncle of uropod 1 with 2 long and one short thick ventrolateral facial spines as in female. [Uropod 3 missing.]

Variations.—No specimens available from Panama with male antenna 2 nor uropod 3 of either sex. Brazil: Specimens poorly preserved, covered with shed cuticle, pleonite 2 lacking serrations and pereonite 5 apparently lacking spines; pleonite 6 apparently with 4 spines. Epimeron 2 with spine pattern of Ms, epimeron 3 = Ls or LS or LSSs. Posterior serrations on epimeron 3 weak but numerous. Tobago: Female "q"; facial formula of epimeron 2 = s, of epimeron 3 = Ls, epimeron 3 with 6 medium posterior serrations; pleonite 2 smooth, pleonite 6 with 5+ spines; uropod 1 ventrolateral facial spine formula, proximal to distal = S-L-L (thick short spine thus proximal). Grenadines: Specimens also poorly preserved and with shed cuticular crystals; pleonite 2 lacking serrations, pleonite 5 with medium (thus enlarged) dorsal serrations, pleonite 6 with 4 spines, epimeron 3 with sharp serrations in female but poorly developed in male (see illustration), spine formulas of epimeron 2 = s, epimeron 3 = L. Florida, Looe Key: Female "s" 3.16 mm, epimeron 2 with one facial setule; spine formula on uropod 1 peduncle = L-L-L; uropod 3 present, each ramus with one apical spine, otherwise apical elements formed of setules. Florida, St. Lucie: Phenotype G: Inner ramus of uropod 3 medial (dorsal) margin with 6 spines, thus 1–2 more than ordinarily present; apices of rami normal; epimeron 2 also lacking anteroventral spines as in Looe Key material; cephalic cusp much sharper than in following phenotype H; other characters such as base of uropod 1, pleonite 2, epimeron 3, rostrum, telson, and spines of pereopods 3–4 are normal. Florida, St. Lucie: Phenotype H: Inner ramus of uropod 3 medial (dorsal) with 2 spines, thus 2 less than ordinarily present; apices of rami normal;

epimeron 2 lacking anteroventral spines as in Looe Key material; cephalic cusp ordinary; other characters such as base of uropod 1, pleonite 2, epimeron 3, rostrum, telson, and spines of pereopods 3–4 are normal. Florida, Fort Pierce: Setule formula on epimeron 2 = ssss, spines on epimeron 3 = Ls, serrations on pleonite 2 = absent, pleonite 5 = medium, spines on pleonite 5 = 0 (?broken off), spines on pleonite 6 = 5, posteriormost basofacial spine on peduncle of uropod 1 = L. Color notes from life: body translucent, urosomites with numerous small, subcircular orange flecks dorsally and laterally; eyes garnet red with silver veining; coxae 1–7 and pereopods with white flecks. South Carolina: Setule formula on epimeron 2 = none, spines on epimeron 3 = L, serrations on pleonite 2 = present, pleonite 5 = medium, spines on pleonite 5 = 0 (?broken off), spines on pleonite 6 = 5 in female, 9 in male, posteriormost basofacial spine on peduncle of uropod 1 = L. Peru: Pleonite 2 without serrations, pleonite 6 with 5–6 spines; spine formula of epimeron 2 = s, epimeron 3 = L. Costa Rica: Pleonite 2 lacking serrations, pleonite 6 with 6 spines, serrations of pleonites 3–4 medium, of pleonite 5 giant (illustrated), spine formula of epimeron 2 = s, of epimeron 3 = L. Baja California: Pleonite 2 lacking serrations, pleonite 5 with medium sized serrations, pleonite 6 with 8+ spines, formulas of epimeron 2 = either LL or LMMSSSsS, epimeron 3 = LLSSS. Coronados Islands: Female "hc", pleonite 2 = 0, pleonite 5 = large teeth, pleonite 6 = 5 spines, epimeron 2 = s, epimeron 3 = Ls. Young male "ha", differing in pleonite 6 = 8+, epimeron 3 = LLMSS. Giant male "hb", differing in epimeron 2 = Mss, epimeron 3 = SLSSSS. Southern California: Large female "Lb" sample 5966, pleonite 2 = 0, pleonite 3 = large teeth, 4 = medium, 5 = large, 6 = 8+ spines; epimeron 2 = LLSMSSS, epimeron 3 = LLsSsSSSSS. Specimens in other samples in this group also have high formulas on epimera 2–3. But La Jolla Scripps Pier female "da" epimeron 2 = s, epimeron 3 = LLMMSS. Oregon: Female "cb" pleonite 2 = 0, pleonite 3 = 0, pleonite 4 = vestigial teeth, pleonite 5 = giant teeth, pleonite 6 = 6+ spines, epimeron 2 = Ms, epimeron 3 = LMMMMM, teeth of epimeron 3 badly worn. Queen Charlotte Islands: Female "ab", pleonite 2 = 0, 3 = small teeth, 4 = medium teeth, 5 = large teeth, 6 = 4 spines only, epimeron 2 = s, epimeron 3 = LLSSSSSS; female "ab" with 7 spines on pleonite 6.

Remarks.—The Florida Key material differs from the type Yucatan material in the lack of spines on epimeron 2 and fewer spines on the telson.

The internal diversity of 8 attributes in this species in males and females (if different) from 17 localities has been analyzed by David Guggenheim of Eco-analysis, Ojai, California who constructed a dendrogram based on calculated Manhattan Metric Distances (Fig. 1). The characters used are (1) presence or absence of deep serrations on pleonite 2; (2) size of serrations on pleonite 5 (small or large); (3) presence or absence of 2 dorsal spines on pleonite 5; (4) number of dorsal spines on pleonite 6 (4 or 5+); (5) formula of spines on epimeron 2 (present or absent); (6) formula of ventral spines on epimeron 3 (1 or 2+); (7) strength of posterior serrations on epimeron 3 (strong/numerous versus weak/sparse); (8) length of posteriormost basofacial spine on peduncle of uropod 1 (short or long). The presence or absence of dorsal serrations on pleonite 2 is perhaps the best character for potential specific division within this complex because it is a yes-no character in which the contrast alternates between strong and deep serrations or obsolescent notches bearing setules. Old museum collections or heavily eroded fresh specimens (owing probably to sandblasting during mud extraction of samples) may be difficult to decipher for this character. The same conclusion applies to the presence or absence of 2 dorsal spines on pleonite 5 which may be broken off consistently in badly treated specimens. On the other hand, spines on pleonite 6 appear to be better protected from erosion than on pleonite 5 and are more trustworthy data. Size of serrations on pleonite 5 (and perhaps on epimeron 3) may also be affected by instar age and nearness to ecdysis. Ventral spines on epimera 2–3 are reliable because we have searched for sockets of missing elements. We had assumed that the Manhattan analysis would show jagged mixture of disjunct localities but instead the dendrogram approaches a perfect geographical contiguity, suggesting that the 8 characters together represent a complex clinal distribution. We are not completely satisfied about the situation and suggest that more work on carefully collected specimens from many more localities should be engaged to solve the possible speciation problem.

Relationship.—This species differs from *G. longimerus* in the presence of facial spines on the peduncle of uropod 3, the presence of thickened posterodorsal spinules on article 2 of pereopod 7, the absence of clavate spines on pereopod 5, the absence of hooded spines on pereopods 3–4 and the different armaments on the flagellum of antenna 2 (compare our Fig. 6 with McKinney, 1980: fig. 5 A2u4t) in which the armaments of *myersi* are shorter, stouter and more serrate.

This species differs from *Gibberosus devaneyi* (from California) in the serrate pleonites 3–5, serrate epimeron 3, strong head cusp and broad rami of uropod 3.

Records.—Brazil: Ilha Sao Sebastiao: Villa Bella, samples 15a, 16a, 16a-25, 17, September 1921, Waldo L. Schmitt (45). Grenadines Islands: Tobago Key, Baradel, samples 21-56, 22-56, 24-56, variously collected by W. L. Schmitt, F. A. Chace and D. V. Nicholson (3 collections), under stones and coral rocks at low tide, or tow net haul at night, or at 3 m depth, 17 March 1956, female "c" 3.27 mm, male "na", specimen "pa" and 39 other specimens. Tobago: Kilwyn Beach, 1 m, 2 October 1983, on algae from rock and sand reef, coll. J. L. Barnard, one female "q" 2.75 mm, and one juvenile. Florida Keys: Looe Key Reef, JDT LK4A, 8 October 1983, backreef sand sample, 1.5 m, J. D. Thomas, collector, female "s" 3.16 mm; male "e" 2.50 mm (illustrated). Hutchinson Island (near St. Lucie Inlet), Florida, 27°21.1′N, 80°14.1′W: 16 June 1980, 8 m, fine moderately sorted sand, station HI-1-2279-TR, phenotype H, 5 specimens, from Sara LeCroy, Applied Biology, Inc.; same, 27°21.4′N, 80°13.3′W, 11 m, 5 March 1982, coarse, poorly sorted shell hash, station HI-CJ-3039-G, phenotype H, 1 specimen; same, 27°19.1′N, 80°13.2′W, 30 June 1982, 8 m, fine moderately sorted sand, station HI-BC-3175-G, phenotype G, 1 specimen. Fort Pierce, Florida: 8 miles ENE of Ft. Pierce Inlet, 15 m, 6 March 1984, coarse shell sand, coll. Hugh Reichardt, one female. Off South Carolina, 31°53′N, 80°46′W: 12 m, USNM Acc. No. 174921, male, female, fragments. Peru: Afuera, Allan Hancock VELERO Sta. 394-35, 22 m, 17 January 1935, female "ea", female "eb". Panama: M. L. Jones Panama 183, beach on Scout (Culebra) Island, Pacific Panama, 08°54′45″N, 79°31′55″W, 10 March 1974, 0.76 m, male "h" 3.09 mm (illustrated gnathopod 2), female "L" 3.09 mm (illustrated several parts); Jones Panama 240-1-6, Scout (Culebra) Island, Panama, 15 October 1977, 1.4 m, 84% sand, 12% silty clay, collected by H. Kaufmann, male "i" 2.77 mm (checked for variations). Costa Rica: Puerto Culebra, Allan Hancock VELERO Station 254-34, 18 m, dredge, 24 February 1934, female "ga" 4.53 mm (illustrated). Baja California: Coronados Islands [?about 1958], 15–24 m, coll. E. W. Fager, J. T. Enright, R. J. Ghelardi, male "ha", male "hb", giant female "hc", and 9 other specimens. California: Corona del Mar: 1933, coll. G. E. MacGinitie, Station 9, USNM Acc. 124734, female "ba". La Jolla, south of Scripps Pier, 1951, 6 m, female "da", female "db" and 3 other specimens. Allan Hancock VELERO Stations 5756, off San Diego, 32°38′45″N, 117°12′15″W, 8.5 m, July 1958, females "ka" and "kb" and one other specimen; 5966, off Los Angeles, 33°58′15″N, 118°28′30″W, 12 m, 22 November 1958, females "la" and "lb"; 2835, off Los Angeles, 33°35′57″N, 118°20′00″W, 370 fm (we assume specimen came into sample from running seawater system of VELERO IV but upper ends of submarine canyons often have submergent shallow-water species), large female "ja". 5564, off Point Conception, 34°27′45″N, 120°12′32″W, 16 m, 28 January 1958, female "fa" and 3 other specimens. Oregon: A. G. Carey, Jr. coll., AD94, off mouth of Columbia River, 12 specimens, females "ca" and "cb", 44°45.4″N; 124°07.1″W, 56 m, 100% sand, 1.89% carbon, 15 June 1964. Canada: British Columbia, Queen Charlotte Islands, coll. E. L. Bousfield, female "aa" 7.5 mm, female "ab" 5.30 mm, male "ac" 4.50 mm.

Distribution.—Caribbean Sea, Cozumel Island, Quintana Roo to Tobago Island; and the Florida Keys and mainland east Florida north to South Carolina, 1–12 m; eastern Pacific Ocean from Peru to British Columbia, 0–29 m.

Gibberosus devaneyi new species
Figures 11, 13–15

Diagnosis.—Spines on pereopods 3–4 scarcely hooded. Pleonites 2–4 not strongly serrate; pleonite 5 dorsally serrate (but with only 4 cusps) and lacking dorsal spines. Distalmost ventrolateral facial spine on peduncle of uropod 1 short and stout; proximalmost armaments on dorsolateral ridge of setal form. Epimeron 3 not serrate. Telson with dorsal spines besides apical spines.

Description of Holotype Male "a" 2.44 mm.—Ocular lobe not drooping, with

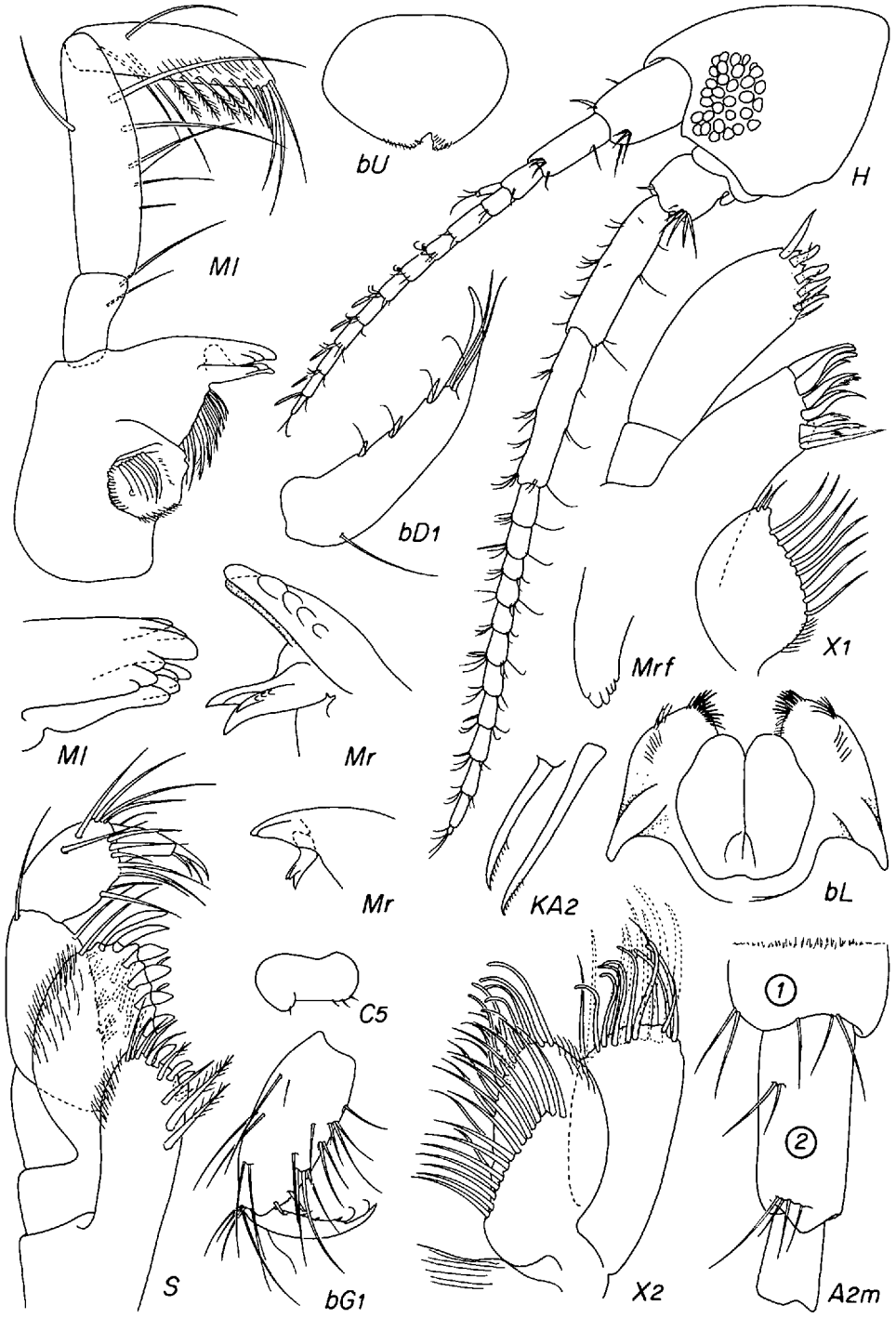

Figure 13. *Gibberosus devaneyi* new species, unattributed figures, holotype male "a"; b = female "b".

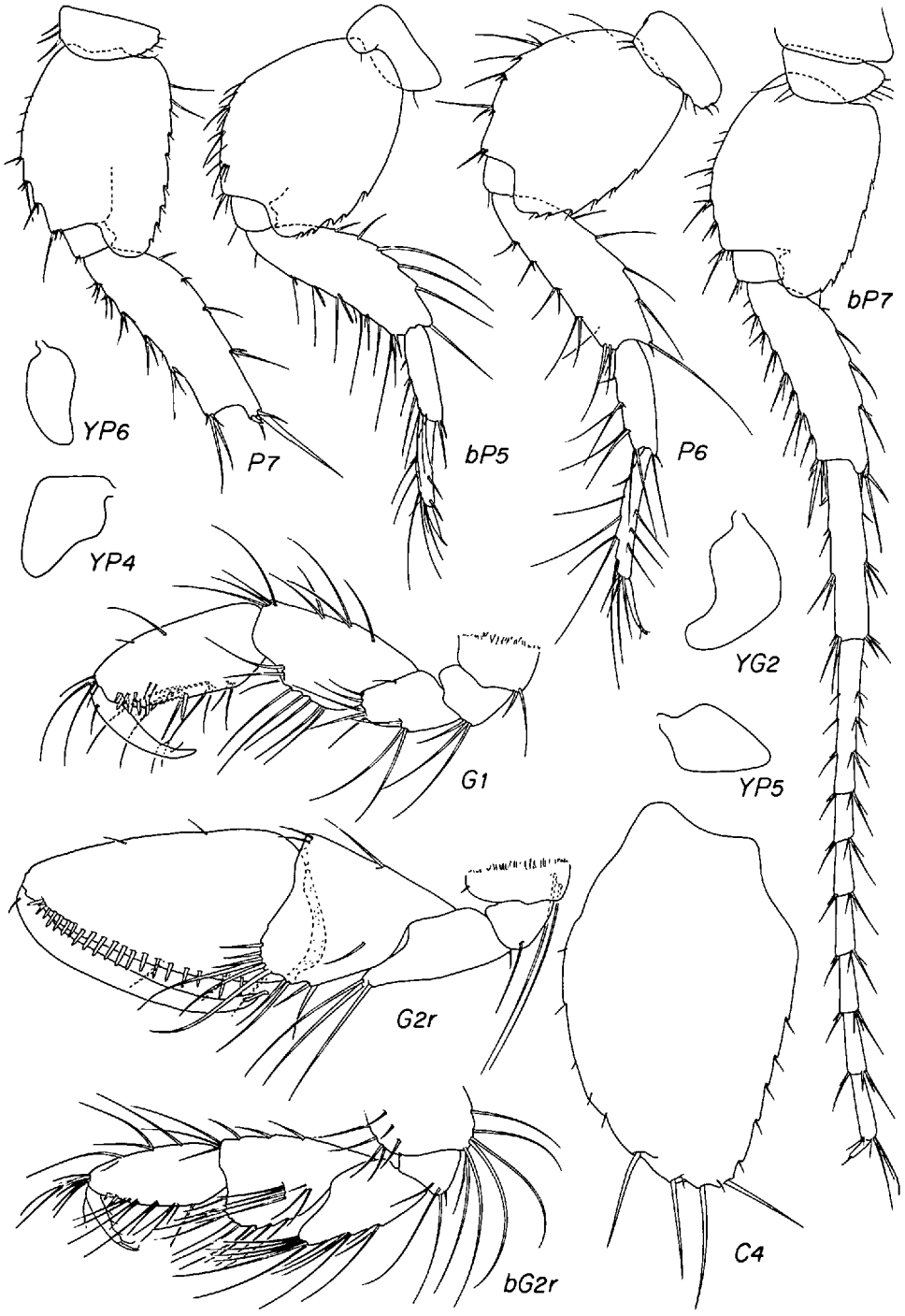

Figure 14. *Gibberosus devaneyi* new species, unattributed figures, holotype male "a"; b = female "b".

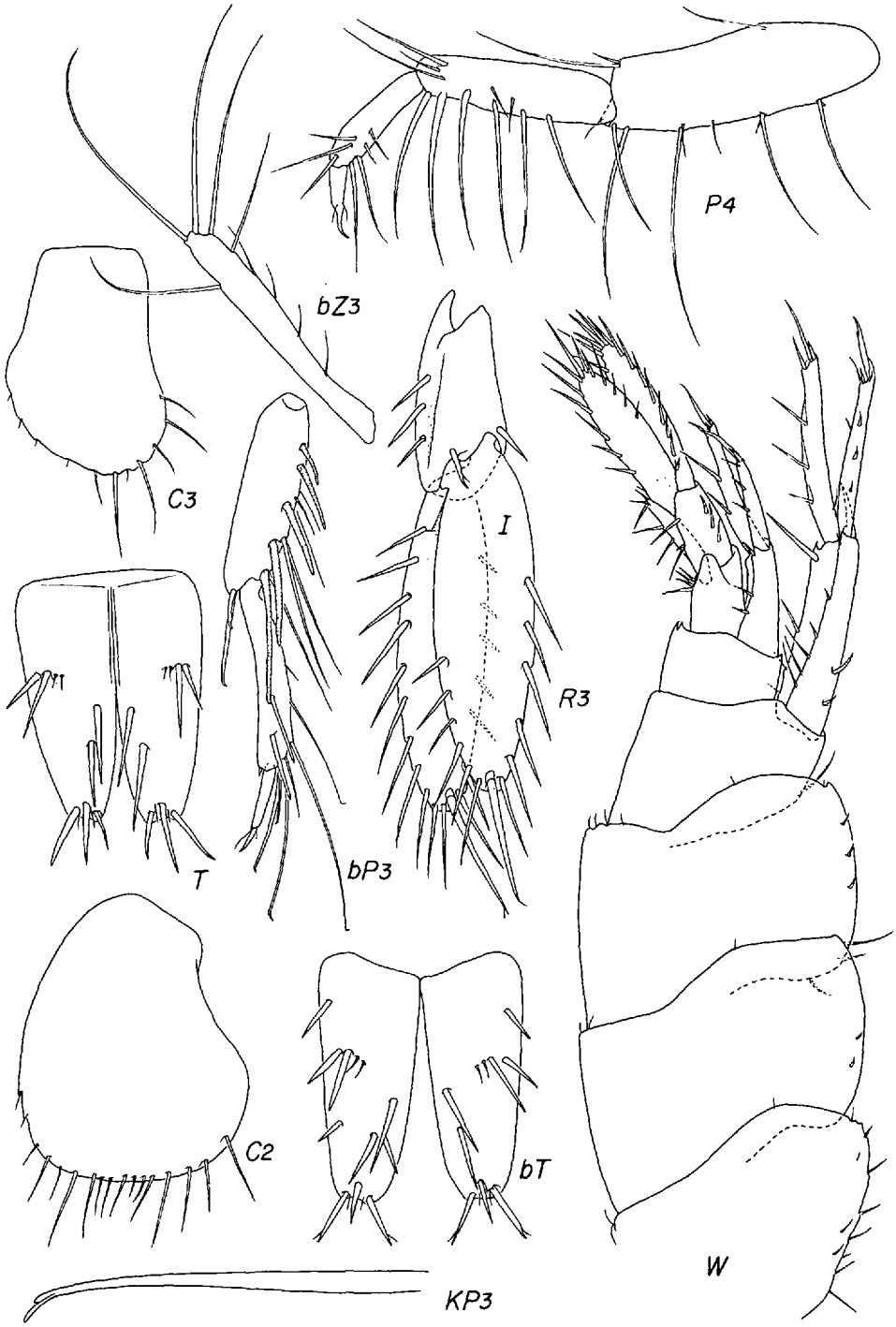

Figure 15. *Gibberosus devaneyi* new species, unattributed figures, holotype male "a"; b = female "b".

obsolescent anterodistal cusp, eye composed of closely packed large ommatidia clear of black-purple pigmentary stain (in alcohol); rostrum short and blunt. Antenna 1 barely exceeding apex of peduncle on antenna 2, article 1 with stout apicoventral and apicolateral spines, article 2 almost as long as article 1, with weak apicomedial blunt protrusion, article 3 much shorter, accessory flagellum 2-articulate, primary flagellum 10-articulate, one aesthetasc present each on articles 5–9, one rudimentary aesthetasc each on articles 3–4; ratio of articles 1, 2, 3 and flagellum = 32:27:13:198. Article 3 of antenna 2 with 3 large facial apicolateral spines, article 4 as long as article 5, flagellum longer than articles 4–5 of peduncle combined but not of the elongate terminal male form found in other species, with 12 articles, ratio of articles 4, 5 and flagellum = 50:50:110, alternating distal articles with stouter curved and serrate spine each.

Epistome unproduced, upper lip deeply notched below, lobes weakly scaled. Right and left incisors 6-toothed, right lacinia mobilis irregularly 4-toothed, left much broader and 4-toothed. Right and left rakers 10+; molar moderately triturative, plumose seta absent. Palp article 1 elongate, almost 40% as long as article 2, latter with 6 diverse medial setae, article 3 about 88% as long as article 2, weakly expanded, with 2 A-setae, 1 B-seta, D setae = 7, E setae = 3. Dorsolateral edges of main lobes on lower lip weakly sinuate, inner lobes fleshy, mandibular lobes strong, with facial extensions (towards observer). Inner plate of maxilla 1 leaf-like, very expanded, with 2 setae on nipple-like apicolateral extension and 8 long medial setae and cluster or row of medial hair-like setules; outer plate with eleven spines, many bifid or multiserrate; palp 2-articulate, both sides symmetrical, with 2 rows of 5 thick apical and 4–5 thin subapical spines, none medially, spines diverse. Inner plate of maxilla 2 broader than outer, face with 15-seta row, medial margin also setose. Inner plate of maxilliped with 3 main very stout spines, 3 medial setae, 6 other apical setae; outer plate with 4 large very ovate medial cusp spines and 3 thinner apical spines, palp poorly setose laterally, article 4 short, stubby, bearing short thick nail and 2 accessory setae.

Coxae 1–2 broadly rounded and widely setose below, coxa 3 weakly bent-linguiform and broad, rounded and setose below, coxa 4 tapering unevenly, broad, not elongate, only posterodorsal margin excavate, lower posterior margin not concave; coxae 1–4 with several minute setae included in counts below, with long marginal setae as follows: coxa 1 with 12 long and 5 short setae, coxa 2 with 7 large and 9 small spine-like setae, coxa 3 with 4 large and 7 small setae, coxa 4 with 4 larger setae and 12 shorter setae (tiny setae included in counts unlike in other species, these coxae thus sparsely setose); coxa 5 without anterodorsal lobe pointing forward, bearing weak anteroventral lobe with one setule, posterior lobe with 3 setules; anteroventral lobe of coxa 6 ordinary, with 2 setules, posterior lobe with 4; setae of coxa 7 divided into anterior and posterior groups of 3 and 4.

Gnathopod 1 small, simple, carpus ovate, not lobate, propodus with about 7 thick distal spines near base of dactyl, dactyl overlapping defining spine on hand margin, inner apical margin with 2 setules, no spines. Gnathopod 2 large, carpus with very broad posterodistal lobe not overextending tangent of propodus, setae widespread, not confined to distal margin of lobe, propodus large, pyriform, base strongly overriding carpus medially, palm occupying full hind margin of propodus, densely spinose, dactyl reaching full length of palm, metacarpus moderately lobate and underriding carpus along posterior margin, this metacarpal lobe weakly setose.

Pereopods 3–4 alike, article 2 bent basally so as to project in front of coxae and overhead for support while lying on back, expanded distally more than in other species of this genus, apex laterally lobate and partially enveloping article 3, only setae present on articles 4–5, none clavate, main setae of article 6 three and four

respectively, and confined apically, dactyl stubby and bearing sharp, curved apical spine. [Pereopod 5 missing but details taken from other specimens] several spines of articles 5–6 on pereopod 5 thickened and weakly clavate or weakly hooded and slightly bent apically; article 2 of pereopods 5–7 weakly pyriform, with posteroventral lobe, anterior bulge weakest on pereopod 7, posterior serrations equally small on these articles; anterior armaments on article 2 of pereopods 5–7 diverse, posterior serrations = numerous, article 2 of pereopod 7 with 2 long posteroproximal setae, article 7 divided into 7 segments. Gills present on coxae 2–6, gill 6 smallest but of medium size, gill 4 largest.

Pleopods 1–2 with posterodistal lateral tooth on peduncle. Only pleonite 5 serrate dorsally, lacking dorsal spines, pleonite 6 with 9 dorsal spines in groups situated tandemly side to side, epimera 1–3 with strong convexity, each with small posteroventral tooth, epimeron 1 with 7 ventral and 2 facial setae, 2 posterior setules, epimeron 2 with 1 posterior setule notch not including tooth and 2 facial spines, epimeron 3 well serrate posteriorly; epimeron 1 with many thin setae ventrally, epimeron 2 with 5 ventral setules, epimeron 3 with 2 long anteroventral spines and 3 short ventrofacial spines in tandem, posterior margin not serrate, with 1 setule besides tooth.

Uropod 1 bearing interramal tooth, dorsolateral margin of peduncle with 3 basal setae and 3 scattered spines more distally, ventrofacial margin of peduncle with anterior-posterior spine formula of sS (s = very short, S = short), all margins on rami of uropods 1–2 normally spinose. Flat outer face of peduncle on uropod 3 with 3 spines, inner and outer (dorsal) apices with one spine, rami narrowly paddle-shaped, all margins widely spinose, each apex with large bulbar spine. Telson cleft to base, each dorsal surface with 4 medium to large spines in even pattern, plus pair of setules at M.40 inside one pair of spines, each apex almost truncate, with 3 spines and 2 setules.

Female "b" 2.88 mm.—Larger than male holotype and thus more spinose, but for example, coxae not as strongly setose as in other species; pereopods 5 and 7 illustrated to show parts missing on male.

Thick serrate spines on male flagellum of antenna 2 seen in male also found in female; hand of gnathopod 1 with only 2 apical spines near base of dactyl (thus assumed sexual difference); inner margin of dactyl with 3 spines and 2 setules; gnathopod 2 of small female form with extended carpal lobe, metacarpal lobe shorter than in other species of genus (see illustration); oostegites thin, strap-shaped, weakly setose, on coxae 2–5; all following differences from male assumed to be related to larger size of specimen: right mandibular palp only with 2A, 2B setae; article 7 of pereopod 7 divided into 10 segments; epimeron 2 with 3 facial spines; formula of ventral-facial spines on epimeron 3 = L—SSS; basofacial formula on uropod 1 peduncle = SSL, setal-spine formula on dorsolateral margin = EEEESSS (E = seta); peduncle of uropod 2 with 4 dorsal spines; peduncle of uropod 3 with 4 basofacial spines; medial margin on inner ramus of uropod 3 with 10 spines (only 6 in male); telson with more spines than male (see illustration).

Illustrations.—Uropods 1–2 not enlarged, see them as attached to pleon.

Etymology.—Named for our friend Dennis Devaney who gave his life for science in Hawaii.

Holotype.—USNM No. 195135, male "a" 2.44 mm, illustrated.

Type-locality.—La Jolla, California, intertidal sand beach in front of Scripps Institution of Oceanography, November 1957 to February 1958, coll. E. W. Fager.

Material.—The type-locality, ovigerous (2 eggs) female "b" 2.88 mm (illustrated) and 50+ other specimens; also type-locality, 19 May 1958, coll. J. T. Enright, 100 specimens; again, 1960, J. T. Enright, 75 specimens. Allan Hancock VELERO III 389-35, Chincha Island, Peru, in [?night]light near west corner, mid island, kelp and sand, 8–10 fathoms, 15 January 1935 (1 male).

Relationship.—This species appears to have its closest affinities to *G. falciformis* because of characters on epimeron 3, uropod 3, and head. *Gibberosus devaneyi* has very apomorphic conditions of cephalic cusp (almost absent), serrations on epimeron 3 (absent) and rami of uropod 3 (very narrow for genus). In *G. falciformis* the cephalic cusp is weak but stronger than in *G. devaneyi,* weak setule notches are present on epimeron 3 and the rami of uropod 3 are slightly broader than in *G. devaneyi.* The two species are also similar in the short-stout condition of the basofacial spines on the peduncle of uropod 1, and the presence of setae on the peduncle of uropod 1 but in *G. falciformis* these are illustrated in Barnard (1969) as being medial and not lateral. *Gibberosus falciformis* lacks dorsal spines on the telson in contrast to *G. devaneyi* and the latter species lacks significant serrations on pleonites 3–4 and has thin, non-clavate and evenly distributed setae on articles 4–5 of pereopods 3–4 in contrast to *G. falciformis.* Gnathopod 2 of the female in *G. falciformis* has a much more protruding article 4 than in *G. devaneyi.*

Distribution.—La Jolla, California, intertidal sand beach; Peru, 18 m.

ACKNOWLEDGMENTS

This work was supported by the Smithsonian Scholarly Research Awards through Assistant Secretary for Science, Dr. D. Challinor, to whom we offer our thanks for his confidence in us. The National Science Foundation supported the study through Grant DEB 8121128. Looe Key material was collected under contract NA82AAA01157 from the Sanctuary Programs Division, Office of Ocean and Coastal Resource Management, NOAA. Dr. G. Hartmann, Universitats Museum, Hamburg, kindly loaned us the original material of *Megaluropus longimerus* Schellenberg. Dr. M. E. Rice, Smithsonian Marine Station at Link Port, Fort Pierce, Florida also provided assistance during this study. We appreciate the help of our museum specialists P. B. Crowe and J. E. Clark. Dr. M. L. Jones of the Smithsonian Institution kindly assisted us with specimens and data collected by H. Kaufmann from Panama. Field support in Belize was facilitated by Dr. K. Ruetzler, Director, Smithsonian Western Atlantic Mangrove Project (SWAMP) at Carrie Bow Cay. M. Carpenter of the Smithsonian also provided tireless assistance in the field. We thank L. Lutz of Mobile, Alabama, for inking our drawings and preparing them for press. We thank the many other collectors of material used in this study. This is contribution No. 192, Caribbean Coral Reef Ecosystems Program, Smithsonian Institution, partly supported by a grant from the Exxon Corporation.

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DATE ACCEPTED: February 26, 1985.

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