

*Diagnosis:* Carapace smooth to noticeably punctate; oblique row of tubercles on branchial regions extending to posterolateral margin; no spines or teeth on posterior or posterolateral margins; dorsal protuberances low, rounded; eyes very large in relation to body; margins of arms and hand noticeably serrate, chelipeds 2.4 to 3 times as long as carapace. (Modified from Rathbun, 1925).



Figure 8. *Solenolambrus tenellus* Stimpson. A. male, Gulf of Mexico, off Egmont Key, Florida, dorsal view; B. same, ventral view; scale lines = 1 mm; C. female, ovigerous, off St. Lucie Inlet, Florida east coast, dorsal view; D. same, ventral view; scale lines = 5 mm.

*Description:* A small, delicate species. Carapace only slightly broader (1:1.07x) than long, about equally produced in front of and behind line of lateral angles; surface rather coarsely punctate; protuberances of carapace much less prominent than in *S. typicus*, those of gastric, cardiac and branchial regions obtusely rounded, without angular ridges, with or without small isolated tubercles; ridge of branchial region sufficiently well marked near posterolateral margin with oblique row of several granules of variable size, but almost obsolete anteriorly; margins of carapace crenulate or obsolete denticulate, teeth most distinct on

flattened, expanded, broadly rounded lateral angle where they are either partially fused or number about six, not crenulated and but little projecting, being defined chiefly by impressed lines on marginal expansion. Two or three denticulated teeth on hepatic region, often obsolete in younger specimens; posterolateral margins slightly concave; posterior margin convex, with lateral angles rounded or obtuse. Rostrum rather prominent, margin often bluntly denticulate in young, sometimes only faintly tridentate at extremity; median tooth smallest, rounded, most prominent. External angle of orbit not produced, but sometimes dentate; one or two small teeth immediately distal to orbit on anterolateral margin. Eye large, with very minute tubercle at summit. Basal joint of external antenna about as long as next segment; subhepatic region slightly excavated, less sharply concave than *S. typicus*, with distinct, thin supplementary ridge obliquely mesial to anterolateral and pterygostomial ridges, nearly meeting latter at epistome. External maxillipeds and efferent channels nearly as in *S. typicus*, but with ridges less strongly tuberculate, if at all, and outer angle of merus more rounded, less acutely prominent. Sternum between bases of chelipeds with distinct, raised, rounded, sparsely tuberculate, transverse ridge; anterior margin with smooth, low, elevated rim, faintly convex on either side; otherwise nearly smooth.

Chelipeds long (about 2x RCL), slender, edges denticulate, surfaces smooth to coarsely punctate, polished. Merus with about 13 irregular denticles on either edge, those anteriorly thin and flattened; third denticle from distal end of anterior margin largest. Carpus with raised, mesial dorsal ridge, indistinctly granulate or denticulate; upper anterior margin thin, crenulate, produced into sharp, flattened tooth distally at junction with manus; lower outer margin with faint ridge ending in bluntly rounded tooth distally. Hand with 11-12 bluntly rounded to sharp, forward-curving teeth on superior edge; spiniform terminal tooth above movable finger considerably longer than others; outer edge of hand with 11-13 obtuse, less prominent, minutely crenulate teeth, inner edge with 18-20 very minute teeth. Walking legs naked, compressed; merus with thin, distinct, nonlaminiiform crest dorsally, that of last pair with noticeable ventral expansion proximally; dactyls long, thin, needle-like.

Abdomen and sternum of male coarsely pitted, otherwise smooth and glabrous; that of female punctate, shining. Gonopods as illustrated (Figure 9 D-F).

*Type-locality:* Off Carysfort, Conch and French Reefs, southeastern Florida; 35-49 fms (64-90 m); types not extant (*vide* Rathbun, 1925, p. 541).

*Distribution:* Off Cape Lookout, North Carolina; Indian River region of Florida from off St. Lucie Inlet, through the Florida Keys to the eastern Gulf of Mexico near Cape St. George; southward through the Bahamas and Cuba to the Lesser Antilles, including St. Croix, St. Vincent and Barbados; 55-330 m. Hourglass Stations D, E, L and M; 55-73 m.

*East Pacific analogue:* None.

*Remarks:* *Solenolambrus tenellus* is moderately common off the west coast of Florida, but appears to be more abundant in the Caribbean Sea. The species is easily distinguishable from its congener, *S. typicus*, both in carapace shape and, in the males, by gonopod morphology (Figures 9, 10). The latter species is sparsely distributed in the Gulf of Mexico and more widely distributed in the Atlantic Ocean, if our specimens can be considered indicative.

## *Solenolambrus typicus* Stimpson, 1871

Figures 9 A-C, 10 B, 11, 12

*Solenolambrus typicus* Stimpson, 1871a, p. 133; 1871b, pp. 101, 102 [discussion]; A. Milne Edwards, 1878, p. 159, pl. 28, figs. 4-4d; 1880b, p. 5; Rathbun, 1894, pp. 84, 85 [discussion]; 1898, p. 261 [listed]; Young, 1900, p. 110; Rathbun, 1901, pp. 81 [in part, *fide* author, not specimens from Puerto Rico], 82 [discussion]; A. Milne Edwards and Bouvier, 1923, p. 356; Rathbun, 1925, pp. 536 [key], 537, text-fig. 148, pls. 192, 193, pl. 279, figs. 1-4; Boone, 1927, p. 42; Flipse, 1930, p. 89 [listed]; Rathbun, 1933, p. 40, text-fig. 34; Chace, 1940, p. 53; Garth, 1946, p. 413 [discussion]; 1958, pp. 458-461 [discussion]; Rodrigues da Costa, 1961, pp. 1, 4 [discussion]; Lewis, 1965, pp. 1055, 1071 [listed]; Williams et al., 1968, p. 63; Rodrigues da Costa, 1969, p. 175; W. Pequegnat, 1970, pp. 173 [listed], 184; W. Pequegnat et al., 1971, p. 3 [listed], pl. 1, map C.

not *Solenolambrus typicus* Cano, 1889, pp. 87, 102, 187 [= *S. arcuatus* Stimpson, 1871, *fide* Rathbun, 1925, p. 538].

**Material examined:** None from Florida east coast or Gulf of Mexico (see *Remarks*).

**Diagnosis:** No more than four teeth on posterior and posterolateral margins; two acute elevations dorsally on median line of carapace; obtuse angle formed by granules dorsally at middle of branchial ridge; 2 1/2 to 3 rows of moderate sized tubercles on lower surface of palm, 2 rows on upper surface, margins dentate; chelipeds 2-2.5 times as long as carapace. (Modified from Rathbun, 1925).

**Description:** Carapace as wide as, or up to 1.2 times wider than, long; surface coarsely punctate, protuberances of gastric and cardiac regions triangularly pyramidal, rounded to acute, with ridges forming angles being faintly to distinctly crenulate; posterior ridge of each pyramid in median line of carapace, anterior ridges diverging in front; cardiac pyramid symmetrical, with each triangular side equal; gastric protuberance asymmetrical, with posterior ridge a short steep slope, and two anterior ridges longer, enclosing gradual, somewhat convex slope toward front; branchial ridge also crenulate, bent at middle into obtuse, almost 90° angle; male with each protuberance usually surmounted by acute spine, only rarely lacking; female with apical angles only rarely as acute. Margins of carapace more or less distinctly crenulate, especially anterolateral margin; latter with three small, poorly developed, often totally obsolescent teeth at outer and posterior end. Anterolateral margins concave anteriorly, obliquely or faintly convex posteriorly. Posterolateral margin distinctly concave to branchial ridge, becoming obliquely straight or faintly sinuous posteriorly; in males, small tooth or even well developed spine may mark angle of branchial ridge. Posterior margin straight, lateral angle sharply defined, either dentiform or spiniform. Eyes rather large, with minute tubercle on anterior side of extremity. Basal joint of external antenna somewhat longer than next joint. Epistome of moderate length, palate deeply concave. External maxillipeds naked, ischium with distinct row of large, granular tubercles near outer margin and near extremity. Sternum with two contiguous, often tuberculate, prominences, plus few tubercles between bases of chelipeds.

Chelipeds long, naked except for some inconspicuous setae on crest of hand. Merus with denticulate margins, surface above smooth for most part, glossy, appearing coarsely punctate under magnification; few tubercles near margins. Carpus with five irregular, denticulate crests. Hand trigonal, with ten strong, distinctly tuberculate teeth on inner crest, 12-14 small, granulate teeth on outer margin; usually 15 teeth increasing regularly in size toward extremity of lower margin; upper and inner surfaces each with two rows of tubercles, outer surface with three rows; all tubercles multigranular, ornamented with from two to five granules. Finger very small, between one-fourth and one-fifth length of palm; dactylus when flexed forming almost right angle with palm. Ambulatory legs compressed, naked, polished, with distinct laminiform crest

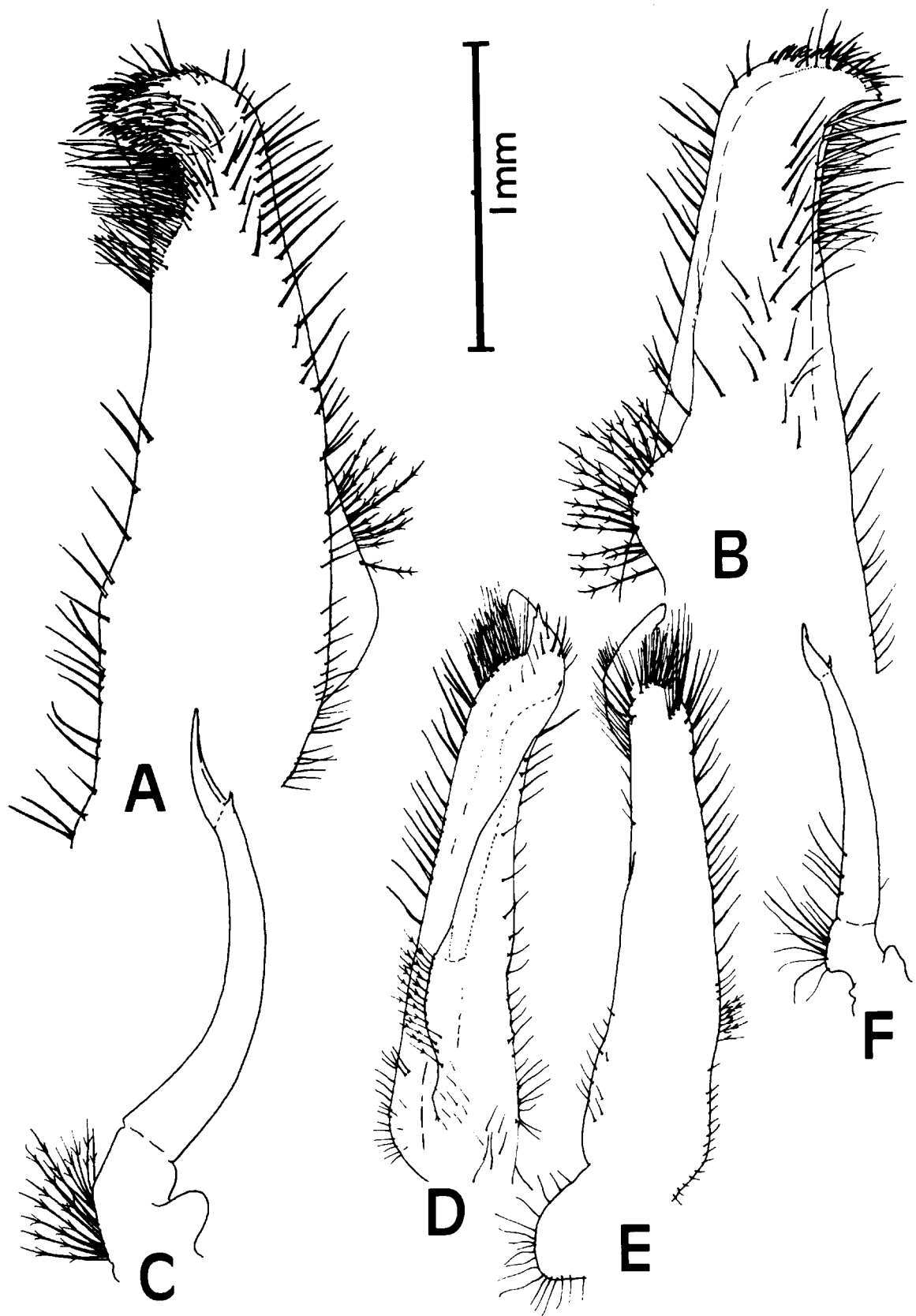


Figure 9. Major and minor left gonopods (pleopods 1 and 2) of male *Solenolambus*. *Solenolambus typicus* Stimpson, Caribbean specimen, R/V *Pillsbury* Sta. P-1354: A. major gonopod, mesioventral view; B. same, mesiolateral view; C. minor gonopod, mesiolateral view. *Solenolambus tenellus* Stimpson, Gulf of Mexico specimen, MHNG: D. major gonopod, medial view; E. same, ventral view; F. minor gonopod, mesiolateral view.

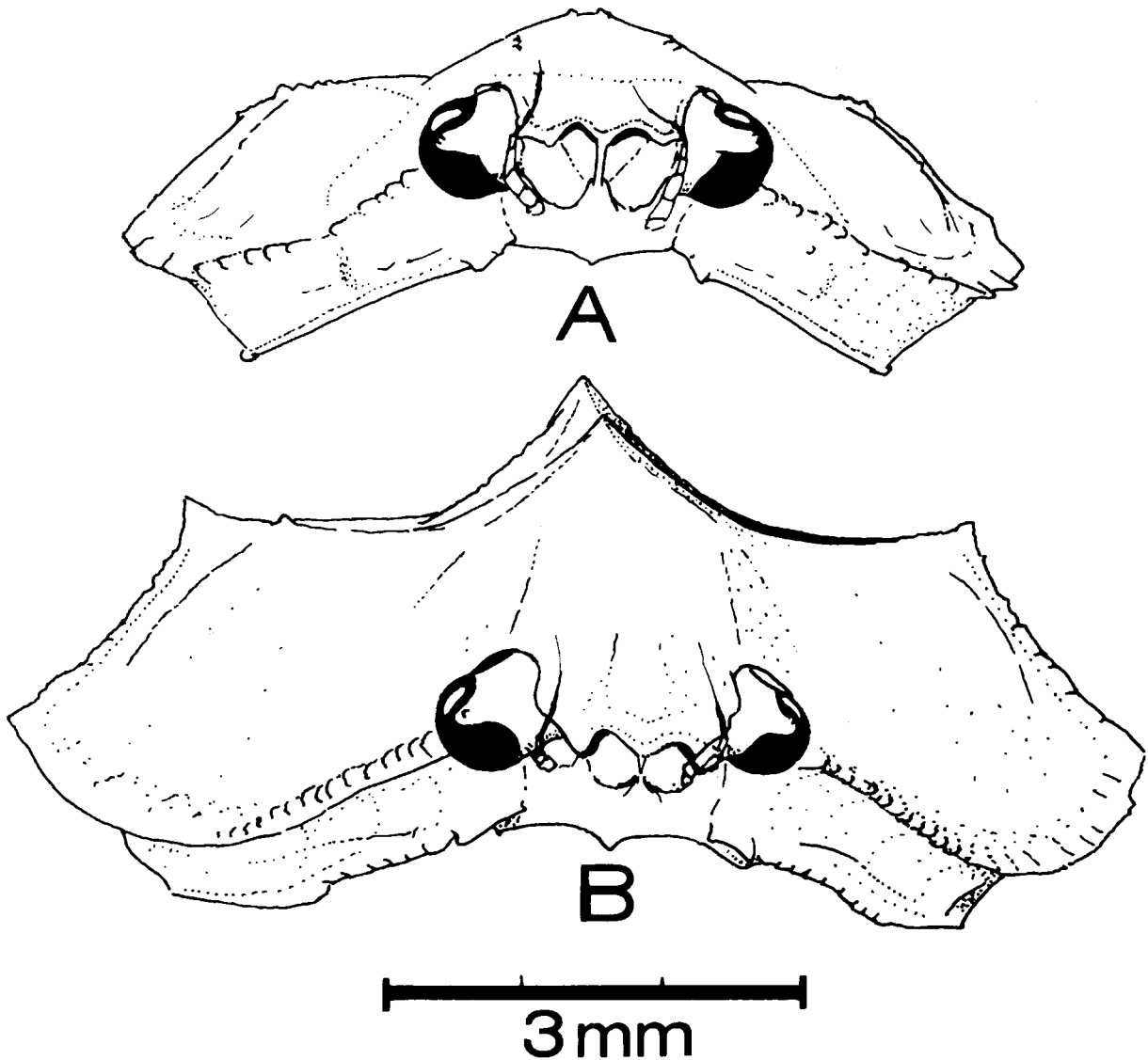


Figure 10. Frontal view of carapace in two species of *Solenolambrus*. A. *Solenolambrus tenellus* Stimpson, SIFP 89:2440, ovigerous female, Atlantic. B. *Solenolambrus typicus* Stimpson, R/V Pillsbury Sta. P-849, male, southeastern Caribbean.

above; meral joints of walking legs 3, 4 with crest below, appearing more developed on fourth; latter crest with lobe-like expansion at inner extremity.

Abdominal somites distinctly tuberculate laterally; telson with single median tubercle. Male abdomen tapering slightly. Gonopods as illustrated (Figure 9 A-C).

*Type-locality*: Off Samboes and Alligator Reefs, Florida; 80-110 fms (146-201 m); types not extant (*vide* Rathbun, 1925, p. 537).

*Distribution*: Cape Hatteras, North Carolina; Bahama Bank; Straits of Florida, including Florida Keys; Gulf of Mexico in the vicinity of Key West, east of Corpus Christi, Texas, and north of Yucatan; Swan Island and

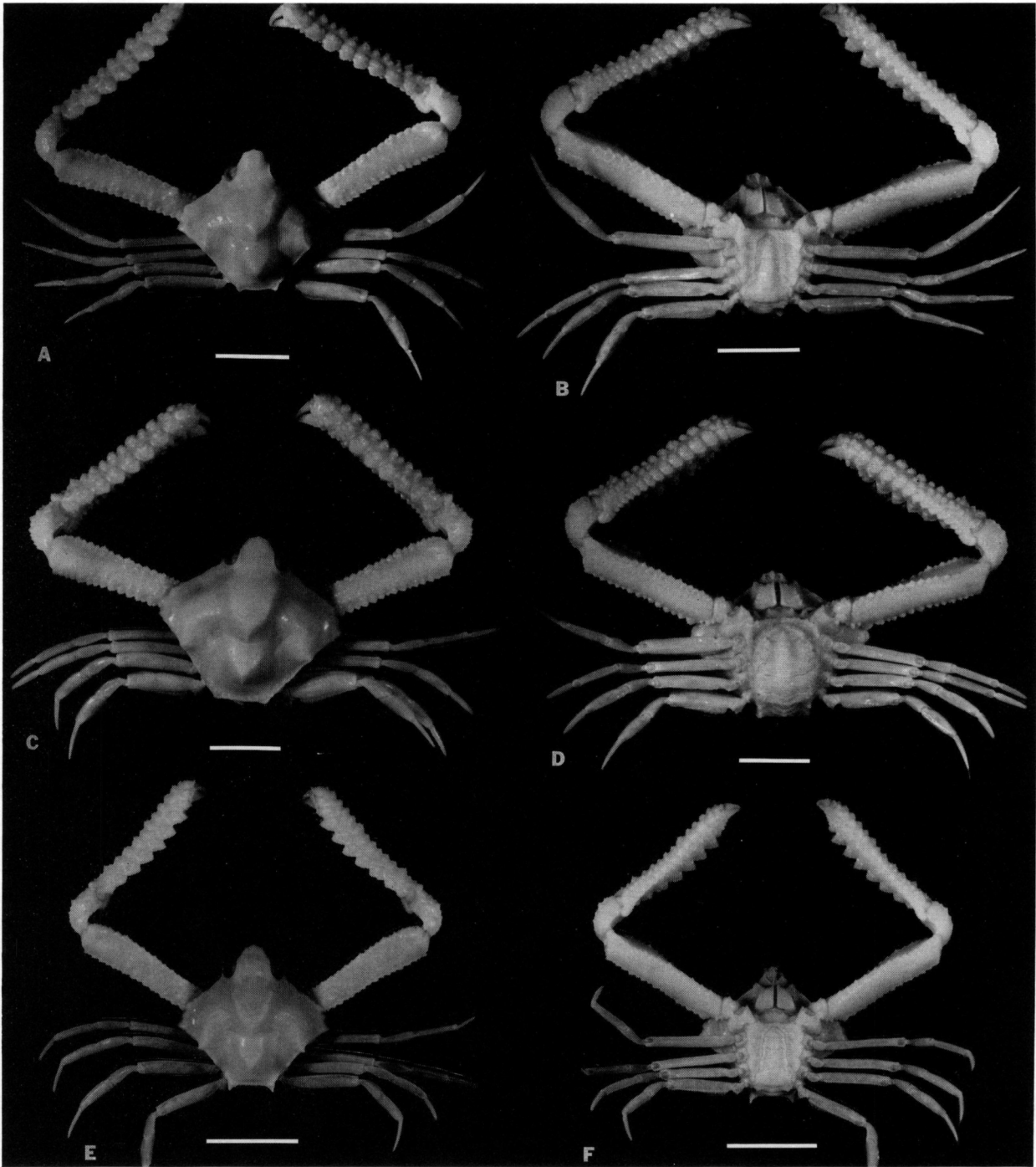


Figure 11. *Solenolambrus typicus* Stimpson. A. male, R/V Pillsbury Sta. P-943, off Guadeloupe, Lesser Antilles, dorsal view; B. same, ventral view; C. female, R/V Pillsbury Sta. P-1357, off Honduras, Central America, dorsal view; D. same, ventral view; E. male, R/V Pillsbury Sta. P-1396, off Dominican Republic, Greater Antilles, dorsal view; F. same, ventral view (this specimen approaches *S. decemspinus* in spination). Scale lines = 5 mm.

Nicaragua shelf; Cuba, Puerto Rico and the Lesser Antilles southward to Surinam and Brazil; 91-618 m.

*East Pacific analogue: Solenolambrus arcuatus* Stimpson, 1871 (*fide* Garth, 1958).

*Remarks:* We examined approximately 20 specimens of *S. typicus* collected by R/V *Pillsbury* in the southern Caribbean Sea and noted much the same variation in the specimens as did Rathbun (1925) in her material. In our specimens, the most spinose, or those with the best developed teeth on the carapace, were almost invariably males (Figure 12A); only a single female approached the acute spinose condition of the dorsal

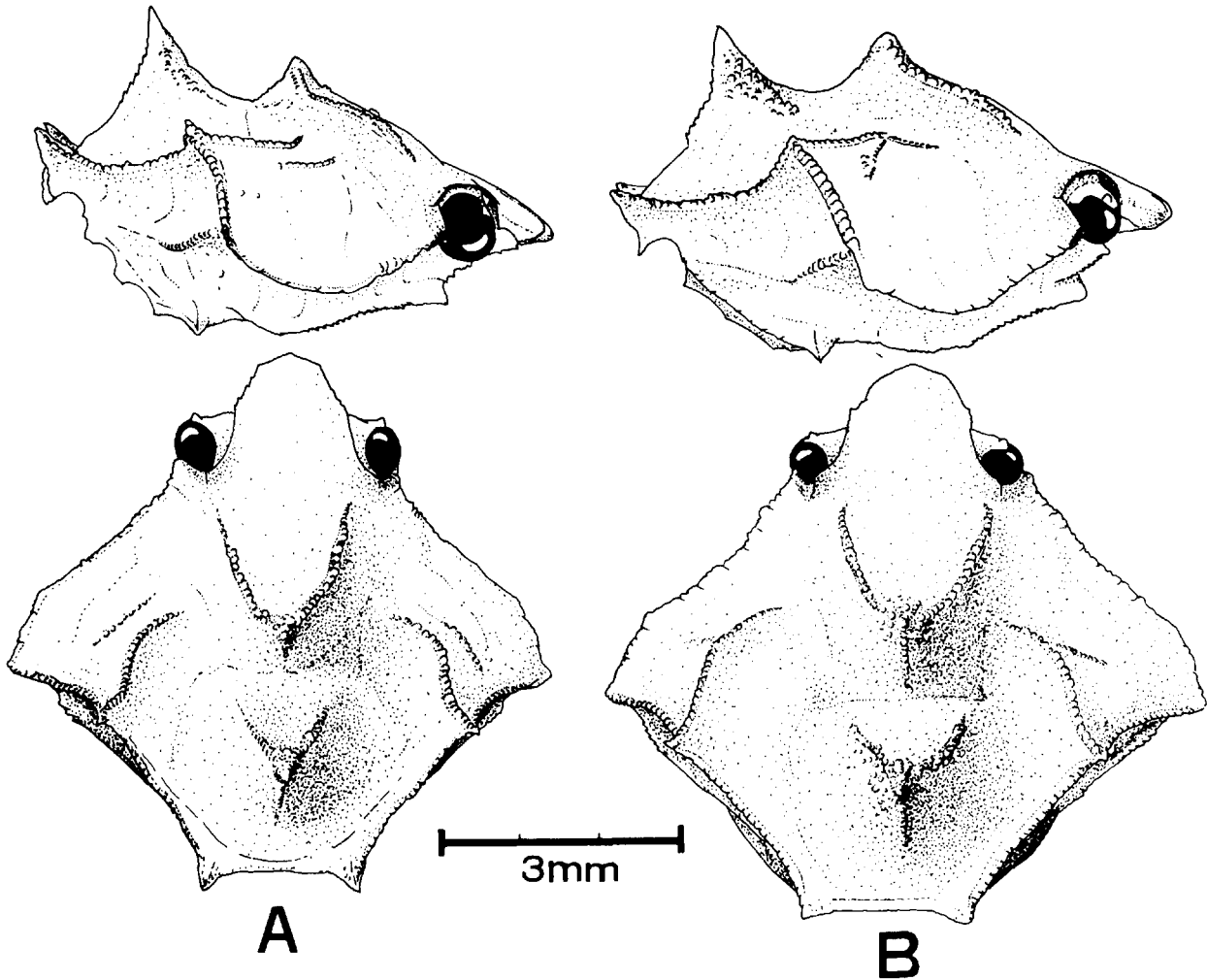


Figure 12. *Solenolambrus typicus* Stimpson, Caribbean specimens: A. male, R/V *Pillsbury* Sta. P-1396, dorsal and right lateral views of "decemspinus-like" carapace; B. male, R/V *Pillsbury* Sta. P-1354, dorsal and right lateral views of more typical carapace. Note development and height of gastric and cardiac spines, and posterior paired teeth.

pyramidal protuberances characteristic of male specimens. We were at first inclined to consider the more ornamented males as possible variants of *S. decemspinus*, an extremely rare species. But as we note in our discussion for that species, we hesitate to consider it valid at this time. None of our male specimens carried an

additional spine or tooth on the posterolateral margin between the very noticeable branchial spine and those of the posterior carapace angles (e.g., Figures 11, 12 B), as supposed to characterize *S. decemspinus*.

No material of *S. typicus* was collected during the Hourglass project or off central east Florida, but the lack of such material is, perhaps, not surprising because no Hourglass stations or RSP stations and only one R/V *Gosnold* station were within the known bathymetric range of the species. The only records from within the Gulf of Mexico appear to be those noted by Milne Edwards (1878) and W. Pequegnat (1970). Contrary to the latter author (1970, p. 184), the species was first recorded not by Stimpson in the Gulf of Mexico but by Agassiz (“ . . . a l’entree du golfe du Mexique”) (in Milne Edwards, 1878, p. 160), but the R/V *Alaminos* material noted by Pequegnat from off Corpus Christi, Texas, does mark the northernmost extension of range for the species in the Gulf of Mexico.

*Solenolambrus decemspinus* Rathbun, 1894

*Solenolambrus decemspinus* Rathbun, 1894, pp. 2 [advanced sheet], 84; 1900, p. 514 [key]; 1901, pp. 81 [key], 82; 1925, pp. 536 [key], 540, pl. 194, figs. 1, 2; 1933, pp. 40 [key], 41.

*Material examined:* None.

*Diagnosis:* Six spines on posterior and posterolateral margins; single spines at anterior ends of branchial ridges; two tall spines on median line of carapace. Outer and lower surfaces of palm with row of large, granulate tubercles parallel to each margin; outer and inner margins tuberculate; dactylus nearly at right angles to palm. Chelipeds twice as long as carapace. (Modified from Rathbun, 1925).

*Type-locality:* Off Cape San Blas, Florida, 28°44'N, 85°16'W; 60 fms (110 m); holotype USNM 18157.

*Distribution:* Northeastern Gulf of Mexico and Puerto Rico; 45-60 fms (82-110 m).

*East Pacific analogue:* None.

*Remarks:* This species is apparently known from only two specimens, the male holotype, and a second male from Puerto Rico. Rathbun (1925) noted that it was closely allied to *Solenolambrus typicus*. The differences between *S. decemspinus* and *S. typicus*, noted by her in the description of *S. decemspinus*, are similar to those we noted between juvenile and mature specimens of other parthenopids (e.g., shape of the anterolateral margin of the carapace, development of spination, and others). Furthermore, as we discussed under the species account for *S. typicus*, males of the latter species tend to be more spinose with sharply acute or spiny dorsal pyramidal protuberances, and with well-developed teeth or spines on the branchial ridge at the posterolateral margin, whereas females do not exhibit these features. In view of these facts, and because *S. decemspinus* is known from only two small, male specimens, it seems possible that the species is only a juvenile form of *S. typicus*. The former species is known from only off northwest Florida and the northeastern Caribbean Sea and has not been collected since 1899. The latter species is widely distributed from North Carolina throughout the Caribbean Sea, and W. Pequegnat (1970) listed a single Gulf of Mexico specimen from the continental shelf off Texas. Although we reluctantly maintain the validity of *S.*



*decemspinus* for the present, unless additional material of the species becomes available, we would be inclined to think it only a juvenile of *S. typicus*.

### Genus *Mesorhoea* Stimpson, 1871

*Mesorhoea* Stimpson, 1871a, p. 135.

#### *Mesorhoea sexspinosa* Stimpson, 1871

Figures 5 E-G, 13

*Mesorhoea sexpinosa* Stimpson, 1871a, p. 136 [*lapsus* for *Mesorhoea sexspinosa*].

*Mesorhoea sexspinosa*: A. Milne Edwards, 1878, p. 164; Rathbun, 1901, p. 81; 1925, p. 547, pl. 200; Flipse, 1930, p. 85 [listed]; Rathbun, 1933, p. 42, text-fig. 36; Crane, 1937, p. 66 [discussion]; Garth, 1946, p. 414 [discussion]; Wass, 1955, p. 171 [listed]; Garth, 1958, p. 466 [discussion]; Bullis and Thompson, 1965, p. 13 [listed]; Righi, 1966, p. 140; Williams et al., 1968, p. 64, text-fig. 17.

*Solenolambrus fastigatus* A. Milne Edwards, 1878, p. 163, pl. 29, fig. 5-5e; 1880b, p. 5; A. Milne Edwards and Bouvier, 1923, p. 357.

*Solenolambrus typicus*: Rathbun, 1901, p. 81 [in part, specimen from Punta de Melones, Puerto Rico, *fide* Rathbun, 1925, p. 547] [not *S. typicus* Stimpson, 1871].

**Material examined:** HOURGLASS STATION B: 1 ♀, 7.8, ovigerous; 6 June 1966; trawl; FSBC I 2858. — 1 ♀, 7.9; 8 October 1966; dredge; SIFP 89:2491. — 1 ♀, 4.8; 5 February 1967; dredge; USNM 156485. — 1 ♂, 4.0; 2 November 1967; dredge; FSBC I 15122. — HOURGLASS STATION J: 1 ♂, 5.6; 4 September 1966; dredge; SIFP 89:2490. — HOURGLASS STATION K: 1 juv., crushed; 4 September 1967; dredge; FSBC I 15123.

**Diagnosis:** Carapace approximately 1.2 to 1.3 times wider than long. Branchial ridges nearly straight; triangular cardiac prominence most slender. Movable finger vertical, without smooth, beaded granules. Outer angle of wrist laminate. (Modified from Rathbun, 1925).

**Description:** Carapace about equally produced anteriorly and posteriorly from transverse line uniting lateral angles. Surface punctate, inconspicuously pubescent. Gastric, cardiac and branchial protuberances strongly angular, each produced into triangular, almost spine-like, prominence, that of cardiac most slender; branchial prominence situated on posterolateral margin, forming projection of same; angles and ridges more or less crenulate or granulate. Lateral edges of gastric protuberance continued forward nearly to front, becoming parallel shortly after diverging from prominence. Branchial ridge curved. Carapace surface between protuberances and ridges appearing concave, sides of protuberances slightly, if at all, swollen. Rostrum short, triangular or truncate. Margins of carapace sublaminiform, nearly entire, with normal crenulation indicated only by faint, often indistinct, impressed lines; microscopic notches sometimes present on anterolateral margin; latter slightly convex toward lateral angle. Posterolateral margin concave, about twice as long as posterior margin; latter convex, terminating in small tooth at either side. Afferent channels deep, separated from subhepatic channels by thin, sharp, prominent, ciliated lamina; channels defined on inner side by ciliated outer edges of ischia of outer maxillipeds. Short ridge extending from anterior angle of buccal area to middle of inner orbital tooth, separating concavity of epistome from that of subhepatic region. Merus of maxilliped 3 with two or three prominent tubercles proximally between postero- and antero-exterior angles, with several smaller tubercles scattered between; anterior margin of meral joint deeply concave or notched sinuously.



Figure 13. *Mesorhoea sexspinosa* Stimpson. A. male, R/V *Pillsbury* Sta. P-1331, off Bluefields, Nicaragua, Central America, dorsal view; B. same, ventral view; C. female, same locality, dorsal view; D. same, ventral view. Scale lines = 3 mm.

Chelipeds short, pubescent, especially on toothed edges; surface between edges smooth; basal joint below with strong, triangular, pyramidal spine similar to, and nearly as large as, those on protuberances of dorsal surface of carapace; margins of merus crenulate, with six or seven small teeth on either edge; carpus flattened above, with two strong crenulate crests, outer crest bearing large spiniform tooth mesially; hand with elevated crest superiorly, bearing nine or more teeth; another ill-defined crest on outer margin, usually with 11 teeth; fingers very small, movable dactyl nearly vertical, at right angle to palm. Walking legs much compressed; carpus and propodus with laminiform crest dorsally; merus and propodus with reduced crests ventrally.

Abdomen of female smooth, shining, glabrous; male lightly granulate to smooth. Gonopods as illustrated (Figure 5 E-G). (Modified from Rathbun, 1925).

*Type-locality:* Four miles southwest of Loggerhead Key, southern Florida; 11 fms (20 m); type not extant (*fide* Rathbun, 1925, p. 547).

*Distribution:* Cape Hatteras to South Carolina; eastern Gulf of Mexico from Pensacola, Florida to Dry Tortugas; on the east coast of Florida only southward through the Keys; Puerto Rico and Flannegan Passage; São Paulo, Brazil; 8-49 m. Hourglass Stations B, J and K; 18-37 m.

*East Pacific analogue:* *Mesorhoea belli* (A. Milne Edwards, 1878) (*fide* Garth, 1958).

*Remarks:* Our six specimens exhibited variation similar to that noted by Rathbun (1925, p. 548), with sharper triangular dorsal protuberances and more distinct teeth on the posterior carapace margins in younger specimens. Although known from North Carolina, the species has not yet been recorded on the eastern Florida coastline north of the Florida Keys, in spite of extensive trawling and dredging in this area.

#### Genus *Leiolambrus* A. Milne Edwards, 1878

*Leiolambrus* A. Milne Edwards, 1878, p. 148.

#### *Leiolambrus nitidus* Rathbun, 1901

Figures 14, 15

*Leiolambrus nitidus* Rathbun, 1901, p. 80, text-fig. 12; 1925, p. 545, pls. 199, 281, fig. 1; Flipse, 1930, p. 84 [listed]; Rathbun, 1933, p. 41, text-fig. 35; Hildebrand, 1954, pp. 272, 346 [listed]; Springer and Bullis, 1956, p. 22 [listed]; Garth, 1958, p. 494 [discussion]; Holthuis, 1959, p. 192; Guinot-Dumortier, 1960, p. 182, figs. 23, 26; Dawson, 1966, p. 177 [listed]; Leary, 1967, pp. 45 [unnumbered text-fig.], 50 [listed]; Felder, 1973, p. 45, pl. 6, fig. 7; L. Pequegnat, 1975, p. 47 [listed].

*Material examined:* None from Florida or the Gulf of Mexico.

*Diagnosis:* Carapace smooth, unarmed dorsally, without strong marginal spines behind; lateral spine large, involving half of anterolateral margin; latter with three wide, serrate teeth before spine. Orbit large, approaching width of rostrum. (Modified from Rathbun, 1925).

*Description:* Carapace smooth, punctate, regions fairly well delimited, without dorsal spines or tubercles, produced anteriorly and containing large, cup-like orbits. Carapace about 1.5 times as wide as long, including lateral spines; anterolateral and posterolateral margins subequal; surface coarsely punctate in elevated regions, smoother in depressions, slightly granulose along summit of cardiac and posterior part of mesogastric protuberances; single, sinuous line of granules on branchial region extending to angle at posterolateral margin. Margin of front feebly tridentate dorsally, distinctly so in frontal view; frontal teeth deflexed, not advanced beyond antennular fossae; orbits wider than long, completely filled by large eyes; suborbital margin, and especially large, triangular, inner suborbital tooth, easily viewed dorsally when eyes retracted. Anterolateral margins obscurely dentate, usually with three more or less distinct teeth, each with