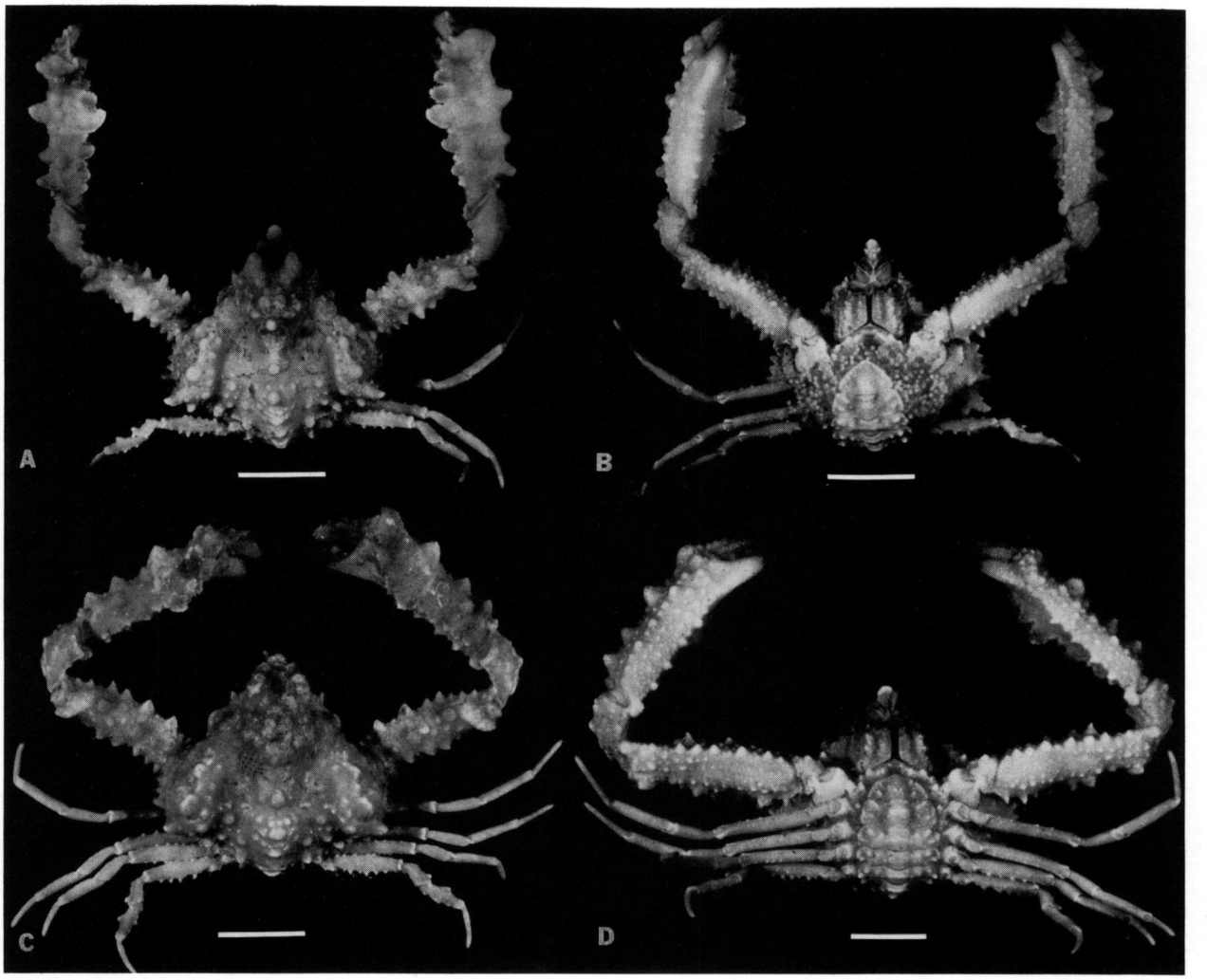


Figure 20. *Parthenope fraterculus* (Stimpson). A. female, ovigerous, sharply tuberculate form, off Cape Canaveral, Florida east coast, dorsal view; B. same, ventral view; C. female, bluntly tuberculate form, off St. Lucie Inlet, Florida east coast, dorsal view; D. same, ventral view. Scale lines = 5 mm.

and northward in the Gulf of Mexico to vicinity of Pensacola Bay; off Cape Catoche, Yucatan, Mexico; Barbados; Surinam; mouth of the Amazon River, Pará, Brazil; 7-201 m. Hourglass Stations C, D, E, L and M; 37-73 m.

*East Pacific analogue*: None.

*Remarks*: Young's (1900) brief description of *Parthenope horrida* might possibly be applied to *P. fraterculus*, known from Barbados. Young referred in synonymy to the "Lazy crab" of Hughes (1750: 262, pl. 25, fig. 1). According to Rathbun (1921), the "Lazy crab" was a composite illustration of the carapace of *Daldorfia horrida* (Linné) [=*Parthenope horrida, auct.*] and the pereiopods of *Mithrax spinosissimus* (Lamarck) (Majidae). The former is an Indo-West Pacific species, known to Hawaii; the latter is common on reefs

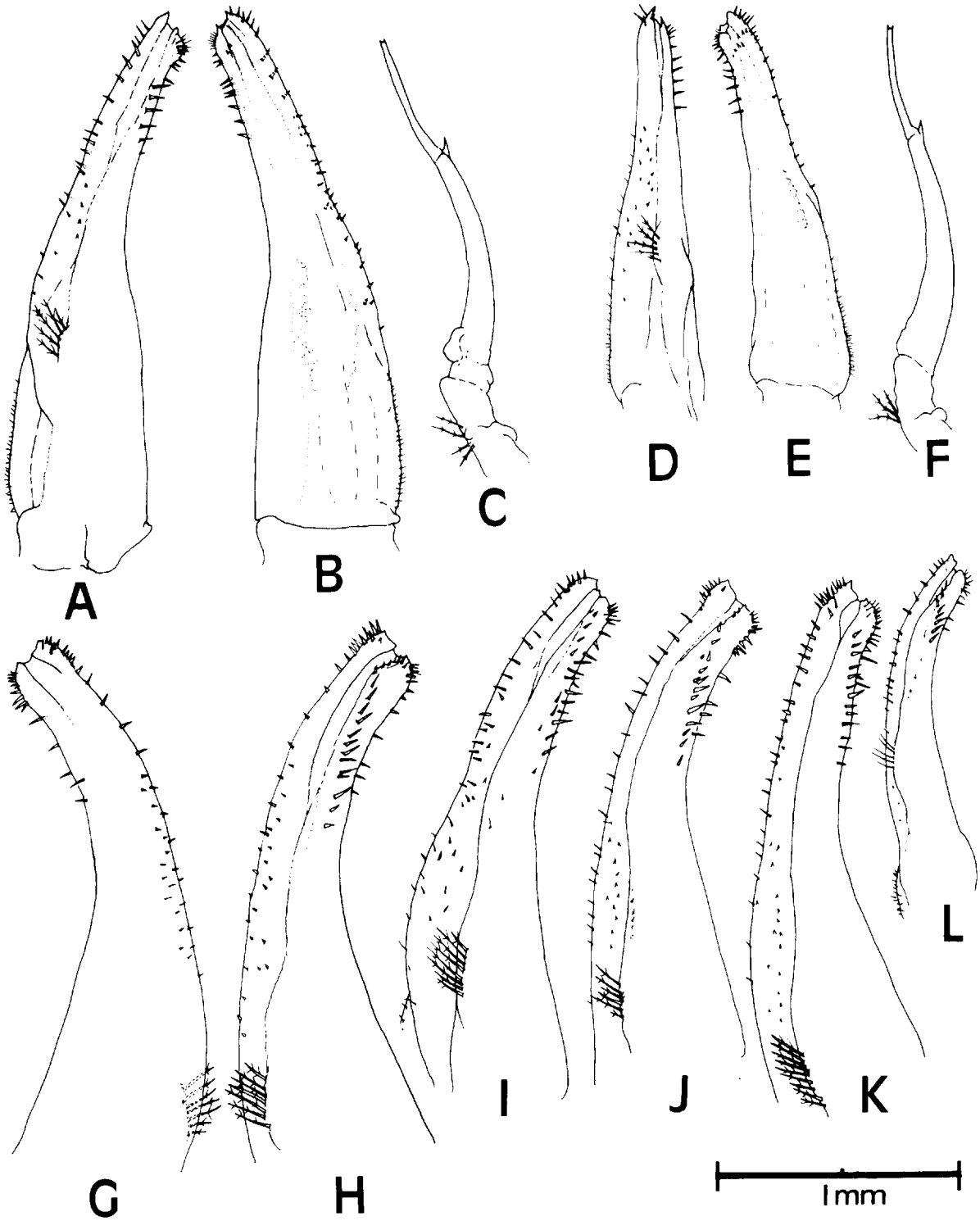


Figure 21. Major and minor left gonopods (pleopods 1 and 2) of male *Parthenope fraterculus* (Stimpson). Gulf of Mexico specimens with well-developed supraorbital tubercle: A. FSBC I 15150, major gonopod, ventral view; B. same, medial view; C. minor gonopod, mesiolateral view; D. MHNG, major gonopod, ventral view; E. same, medial view; F. minor gonopod, ventral view; G. SIFP 89:2828, major gonopod, medial view; H. same, ventral view. Atlantic specimens: I. SIFP 89:1888, major gonopod, medial view, specimen with no subraorbital tubercle; J. same lot, specimen with subraorbital tubercle; K. SIFP 89:1443; major gonopod, medial view, specimen with heavily rounded supraorbital ridge. Gulf of Mexico specimen: L. FSBC I 15172, major gonopod, medial view, specimen lacking subraorbital tubercle.

throughout the West Indies. Von Martens (1872: 8b) considered the "Lazy crab" only a male *M. spinosissimus*.

The range of morphological variation in *Parthenope fraterculus* is extensive. We have examined specimens in which the carapace was almost completely smooth or only slightly pitted, in decided contrast to other individuals in which the carapace was heavily nodulose or pustulose. Still other specimens exhibited conspicuous spines, spinules, and teeth dorsally and marginally. Branchial ridges varied from rounded to sharply carinate. The rostrum may be wide and bluntly rounded or narrow and tapering, and may or may not possess marginal teeth or spines. The angle of declivity can be slightly or acutely deflexed. The supraorbital ridge is gently rounded in some individuals, more inflated in others, and may be developed into a distinct, sharp tubercle in still other specimens. This tubercle could be discerned in some juveniles as small as 2.8 mm RCL.

The supraorbital tubercle appears to exhibit a form of sexual dimorphism; males possessed this feature more than females, although some of the latter did have a noticeable prominence above the orbit. Of 176 individuals examined, 97 (55%) possessed such tubercles in one form or another, whereas 79 (45%) did not. In tuberculate individuals, 36 (37%) were males, 13 (13%) were females, and 48 (49%) were juveniles. Some males also had a distinct tuft of long setae springing from the apex of the tubercle, a feature not seen in any females we examined. These setae were present in males as small as 5.2 mm RCL. Non-tuberculate individuals consisted of 20 males (25%), 46 females (58%) and 13 juveniles (16%).

Presence or absence of a distinct supraorbital tubercle, with or without apical setae, may also be correlated with geographical occurrence. A series of 56 males (30 Hourglass specimens, 26 R/V *Gosnold* specimens), and 59 females (30 Hourglass, 29 R/V *Gosnold*) were examined. Of the 36 males and 13 females with tubercles, 38 (78%) occurred in the Gulf of Mexico, whereas 11 (22%) were collected from the Atlantic Ocean. Contrarily, of the 20 non-tuberculate males and 46 females, 20 females and 2 males (33%) occurred in the Gulf while 18 males and 26 females (67%) were collected in the Atlantic. These data are presented in Table 4 in another manner. Sixty-four percent of all males examined were tuberculate, but this constituted 28 (93%)

TABLE 4. COMPARISON OF TWO MORPHOLOGICAL FORMS OF *Parthenope fraterculus* IN THE GULF OF MEXICO AND OFF THE CENTRAL EASTERN FLORIDA COAST.

| Number and Sex | Area | Supraorbital Tubercle | | N |
|---|---|---|---|---|
| | | Present | Absent | |
| 30 males | Gulf of Mexico | 28 (50%) | 2 (4%) | |
| 26 males | Central eastern Florida coast | 8 (14%) | 18 (32%) | 56 |
| 30 females | Gulf of Mexico | 10 (17%) | 20 (34%) | |
| 29 females | Central eastern Florida coast | 3 (5%) | 26 (44%) | 59 |

of all Gulf of Mexico specimens and only 8 (31%) of those from off central east Florida. The data are less decisive for females, because 78% of all females examined were non-tuberculate. However, 10 (33%) of those from the Gulf of Mexico possessed tubercules, whereas only 3 (10%) from Atlantic stations were tuberculate. It would thus appear that the Gulf of Mexico population of *Parthenope fraterculus* can be distinguished in many instances by the presence of a distinct supraorbital prominence or tubercle, which in most males was armed apically with a noticeable tuft of setae.

The type of carapace variation just discussed for *P. fraterculus* is similar to that exhibited by another parthenopid, *Parthenope* [as *Lambrus*] *massena* Roux, 1830, a Mediterranean and West African species which resembles, to some extent, *P. fraterculus*. Monod (1956) distinguished five more or less geographically restricted "formas": *P. massena* forma *typicus*, f. *atlanticus*, f. *pulchellus*, f. *rugosus*, and f. *bicarinatus*. All differed to some degree in the form of carapace ornamentation, cheliped armature, and rostral shape. Examination of Monod's illustrations (1956, figures 840-847) provides a good example of the degree, although not necessarily the kind, of ornamentation which similarly occurs in *P. fraterculus*. The latter species has not yet been given "forma" designations and, we believe, rightly so in view of the wide-scale variation to which the species is apparently subject.

Although we were able to distinguish with a reasonable degree of certitude the two forms from our areas of study, *i.e.*, those with well-developed supraorbital tubercles and (often) with apical setae, and those without either of these features, the range of variation in other features such as carapace ornamentation or cheliped armament was too extensive to allow further separation. Examination of gonopods in tuberculate and non-tuberculate populations of males from both the Gulf of Mexico and Atlantic Ocean revealed both individual variation in spination on the major gonopod (pleopod 1) and a general armament in gonopods 1 and 2 which, again, did not allow further distinction (Figure 21). The major gonopod in all males invariably possessed three rows of spines or spinules, one each located more or less marginally near the tip, the third located mesially and progressing distally. Tuberculate males (Figure 21 A-H, J) were in themselves somewhat variable in regard to actual numbers and positioning of these spinules, with older individuals, as a rule, being more noticeably spiny (Figure 21 H, J). A similar situation was observed in non-tuberculate males (Figure 21 I, K, L). If further material from these two areas remains consistent in regard to features just mentioned, then subspecific status might be warranted.

Although the principal distribution of *P. fraterculus* seems to be the Gulf of Mexico and the northwestern Atlantic to Cape Hatteras (see Figure 28), it remains to be seen whether males or females from the western Gulf of Mexico, or in the southern populations from the Lesser Antilles or the northeastern coast of South America to Brazil, exhibit any geographically correlated variation similar to that just noted.

### *Parthenope* cf. *fraterculus* (Stimpson, 1871)

*Material examined*: HOURGLASS STATION E: 1 juv., 3.0; 9 October 1966; dredge; FSBC I 15180. — 2 juvs., 2.9, crushed; 9 November 1966; trawl; FSBC I 15181. — HOURGLASS STATION L: 1 juv., 2.1; 13 January 1967; trawl; FSBC I 15182. — 5 juvs., 3.0-3.8; 7 June 1967; dredge; FSBC I 15183. — HOURGLASS STATION M: 1 juv., 3.0; 12 May 1966; dredge; FSBC I 15184. — 1 juv., 2.8; 5 July 1966; dredge; FSBC I 15185. — 1 juv., 3.0; 13 October 1966; trawl; FSBC I 15186. — 1 juv., 2.9; 13 November 1966; dredge; FSBC I 15187. — 1 juv., crushed; 7 December 1966; dredge; FSBC I 15188. — 1 ♂, 4.0; 1 juv., 2.6; 9 March 1967; dredge; FSBC I 15189. — 1 juv., 3.0; 8 April 1967; dredge; FSBC I 15190. — 1 ♂, 3.9; 1 juv., crushed; 8 August 1967; dredge; FSBC I 15191. — 1 juv., 4.8; 5 September 1967; dredge; FSBC I 15192.

*Distribution*: Eastern Gulf of Mexico, Hourglass Stations E, L and M; 55-73 m.

*Remarks*: All of these specimens were too little developed to adequately identify them. Most, however, appeared to be young *P. fraterculus* based on general body configuration and rostral shape. As noted under the account of *Parthenope pourtalesii*, juveniles of that species are extremely close or identical to those of *P.*

*fraterculus* in general morphology. There is thus the possibility that some of the above specimens are actually *P. pourtalesii* juveniles. If our identification of the above material is correct, however, then the Hourglass Cruises did not obtain any *P. pourtalesii*, juvenile or adult, during 28 months of sampling in the eastern Gulf of Mexico. Further comment on morphology is presented in the following account.

### *Parthenope pourtalesii* (Stimpson, 1871)

Figures 17 A-D, 22

*Lambrus pourtalesii* Stimpson, 1871a, p. 129; A. Milne Edwards, 1878, p. 149, pl. 30, fig. 2-2d; Kingsley, 1879, p. 150 [discussion]; A. Milne Edwards, 1880b, p. 4; Miers, 1886, p. 93 [listed]; Faxon, 1893, p. 152 [discussion, and synonymy of *L. verrillii* Smith]; 1895, pp. 15, 16 [discussion]; Rathbun, 1898, p. 260 [listed]; 1900, p. 514 [key], text-fig. 11; Arnold, 1903, p. 286, text-fig., pl. 64.

*Lambrus verrillii* Smith, 1881, pp. 415, 451 [listed]; 1883, p. 14; Verrill, 1885, p. 557 [listed]; Smith, 1886, p. 628 [24], pl. 2, fig. 2; Faxon, 1895, pp. 15, 16 [discussion]; Verrill, 1908, pp. 418, 419 [discussion].

*Lambrous pourtalesii*: Faxon, 1896, p. 154 [listed].

*Lambrus ponstalesi*: Gundlach and Torralbas, 1899 (1900), text-fig. 302 [reprint (1917), pl. [2], fig. 4] [*lapsus* for *pourtalesii*].

*Lambrus (Lambrus) pourtalesii*: Young, 1900, pp. 102 [key], 103.

*Parthenope Pourtalesii*: Verrill, 1908, pp. 418, 419.

*Parthenope pourtalesii*: Fowler, 1912, p. 587; Leary, 1967, p. 50 [listed].

*Parthenope verrillii*: Fowler, 1912, 587 [listed].

*Parthenope (Platylambrus) pourtalesii*: Hay and Shore, 1918, p. 462, pl. 39, fig. 6; Rathbun, 1925, pp. 512 [key], 521, pls. 182, 183, 276; Boone, 1930, p. 120 [probably not pl. 37, = *P. fraterculus* (Stimpson, 1871)?]; Rathbun, 1933, p. 39, text-fig. 33; Chace, 1940, p. 53; Garth, 1946, p. 409 [listed Atlantic analogue]; Springer and Bullis, 1956, p. 22 [listed]; Bullis and Thompson, 1965, p. 13 [listed]; Williams, 1965, pp. 266 [key], 268, text-figs. 248, 252C; W. Pequegnat, 1970, pp. 173 [listed], 183; W. Pequegnat et al., 1971, p. 3 [listed], pl. 1, map C; Felder, 1973, p. 48 [key], pl. 6, fig. 9 [right chela]; Williams, 1974, pp. 28 [key], 42, text-fig. 77; L. Pequegnat, 1975, p. 48 [listed].

*Lambrus pourtalesi*: A. Milne Edwards and Bouvier, 1923, p. 354.

*Platylambrus pourtalesii*: Flipse, 1930, p. 86 [listed].

*Parthenope (Platylambrus) pourtalesi*: Garth, 1958, p. 439 [discussion].

*Material examined*: EAST FLORIDA: RSP STATION 003: 1 ♂, 11.7; 14 August 1974; trawl; SIFP 89:1412. —RSP STATION 004: 1 ♀, 13.3; 11 September 1973; trawl; SIFP 89:2815. — RSP STATION 005: 1 ♂, 24.5; 4 April 1973; trawl; FSBC I 9863. — RSP STATION 180: 1 ♂, 14.0; 13 September 1973; trawl; MHNG. — R/V GOSNOLD STATION 229/412: 1 ♂, 22.6; 17 April 1974; trawl; SIFP 89:0975. — R/V GOSNOLD STATION 248/731: 3 ♂, 25.2-39.5; 3 ♀, 23.3-30.5; 17 September 1974; trawl; UZMC 15.I.1977. — R/V GOSNOLD STATION 248/737: 1 ♀, 17.8; 18 September 1974; dredge; MHNG.

*Diagnosis*: Carapace about 1.2 times wider than long, high, regions deeply separated, anterior margin continuing obliquely or slightly concave to rounded lateral margins; lateral margin inflated, falling away obliquely, with series of large spines; largest spine at lateral angle, another at posterior end of branchial ridge;

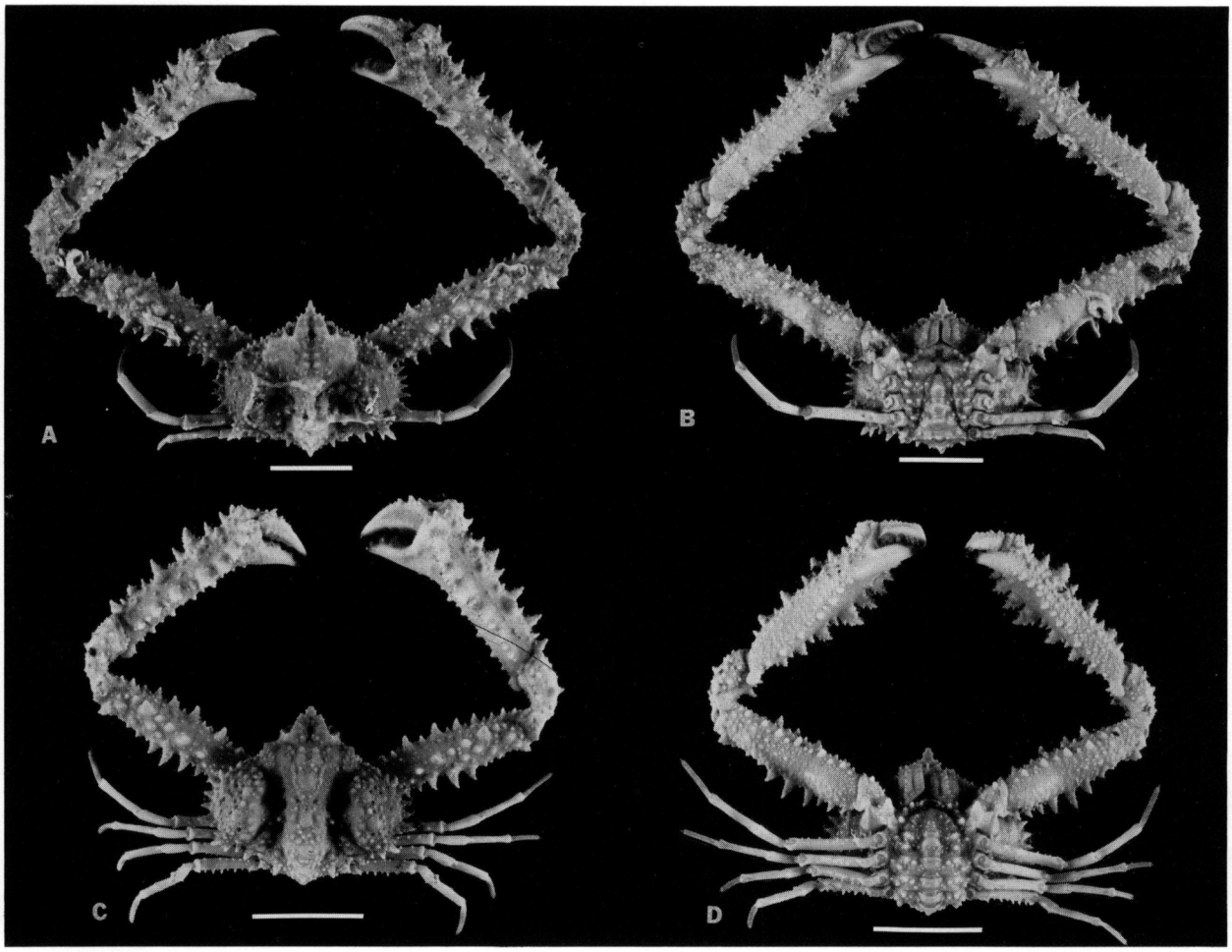


Figure 22. *Parthenope pourtalesii* (Stimpson). A. male, off Cape Canaveral, Florida east coast, dorsal view; B. same, ventral view; C. female, same locality, dorsal view; D. same, ventral view. Scale lines = 20 mm.

arms not flat above; dactyl of walking legs setose, that of fourth leg 1.3 times longer than propodus. (Modified from Rathbun, 1925).

*Description*: Crab heavily tuberculate and spiny. Carapace 1.08 to 1.28 times wider than long, broadly triangular, angles rounded, widest at spine of posterolateral angle. Branchial regions inflated, sloping outward moderately, rather deeply separated from similarly inflated gastric, cardiac and hepatic regions; largest spine at posterolateral angle, with one or two spines at base. Hepatic margin armed with small, prominent spine; anterolateral margins obliquely or slightly concave proximally, becoming convex after cervical suture, armed with eight or nine teeth or spines increasing in size posteriad, first three or four shorter than next five. Posterolateral margin armed with three or four unequal spines in addition to large single or double spine on branchial ridge. Posterior margin produced medially, with three larger and several smaller spines, largest appearing on medial line and flanking either side. Distinct depressions located at hepatic region and on either side of metagastric ridge, becoming deep sulci posteriorly adjacent to inflated cardiac region. General surface pitted and granulate, covered especially in elevated portions with granulate tubercles of varying size, largest (sometimes produced into blunt spines in males) disposed medially as follows: one

gastric, one genital (median), two cardiac (submedian); two on branchial ridge in line with longest lateral spines; tendency to form several rows of tubercles on branchial regions. Front produced into long, narrow, bluntly rounded or obtusely triangular rostrum; supraorbital ridge often developed, bearing distinct tubercle; rostral tooth often with denticle on either side; short spine below and outside subacute basal tooth.

Chelipeds 2.5 to 3 times longer than carapace, equal, very rough, armed with laciniate teeth and spines. Merus convex above, distinctly tuberculate, bearing row of unequal spines extending obliquely to anterodistal angle; posterior margin armed with three to seven long spines on proximal half, proximal spines larger; blunt, curved tooth near distal end. Anterior margin with four or five larger and several smaller spines. Wrist usually with largest spines at inner angle, largest spine often tuberculate, one or two smaller spines interspersed between latter and anterior margin of wrist; additional spines and tubercles on convex outer surface, those on dorsal margin and mesial and mesioventral surfaces prominent. Hand with about ten to twelve triangular and tuberculate spines of irregular height and position on outer margin, eight or ten similarly on inner margin, latter broader and closer together than former, particularly toward fingers. Single, forward-curving spine distally on dorsal inner margin of palm at junction with dactyl, followed by two to four smaller spines of decreasing size on proximal, upper, inner margin of movable finger; fingers gaping in right, nearly meeting in left, cheliped. Meral joints of walking legs spinulose, more prominently so dorsally than ventrally; carpus and propodus of last pair with large, flattened, spine-like tubercle on distal, dorsal margin of former, and mediodorsal margin of latter; dactyl 1.3 times longer than propodus, heavily setose.

Sternal region noticeably tuberculate, with single, large tubercles at bases of chelipeds and walking legs 1-3. Abdominal somites 2-6 with single, large, transversely compressed tubercles medially; several large conical tubercles at extremity of somites 2-6, becoming smaller and more scattered on somite 7. Gonopods as illustrated (Figure 17 A-D).

*Type-locality*: Off Conch Reef, French Reef, and American Shoal, southern Florida; 40-117 fms (73-214 m); types not extant (*fide* Rathbun, 1925, p. 521).

*Distribution*: Off Martha's Vineyard, Massachusetts; off New Jersey; North and South Carolina; eastern Florida to Key West and Western Dry Rocks; Gulf of Mexico from southwestern Florida, and off Mississippi River delta to Texas and Rio Grande, Mexico; entrance to Gulf of Mexico off Yucatan and off Cape San Antonio, Cuba; north coast of Cuba; Lesser Antilles from Virgin Islands and Grenada; 18-348 m.

*East Pacific analogue*: *Parthenope* (*Platylambrus*) *exilipes* (Rathbun, 1893) (*fide* Garth, 1958).

*Remarks*: We noted in our material much the same variation as did Rathbun (1925) in the number, prominence, and positioning of tubercles and teeth, and in construction and ornamentation of the rostrum. Elevations of the carapace tended generally to be tubercles in females and more spine-like in males, but either could occur in one or the other sex. In much of our adult material we also noted that the supraorbital ridge was often developed into a distinct tubercle, a feature noted much earlier by Smith (1883; 1886, pl. 2, fig. 2), and one which led that author to designate some of his material for a short time as a new species, *Lambrus* (= *Parthenope*) *verrillii*. Smith (1886) later considered that material to be simply a variation of *P. pourtalesii*.

As we noted in our account under *Parthenope fraterculus*, that species also possesses on occasion strongly developed supraorbital tubercles. Indeed, great difficulty is encountered in trying to separate some juvenile specimens of *P. pourtalesii* from juvenile *P. fraterculus*, and the very young or early crab stages are usually impossible to distinguish to either species. The difficulty is compounded by those juveniles of *P.*

*fraterculus* which possess a distinct supraorbital spinule or tubercle, which might lead one to identify these specimens (as we did for a time) as juvenile *P. pourtalesii*. However, the general outline of the carapace in the former seems to be more angular, not as rounded as in the few specimens of *P. pourtalesii* we examined. Outer margins of the branchial regions slope more gradually in *P. pourtalesii* than in *P. fraterculus*. Moreover, dorsal and ventral margins of meri of the walking legs were less noticeably tuberculate than those of *P. fraterculus*. These features, and especially the relative length of the dactylus to the propodus in the last pair of walking legs, allowed us to separate some juveniles of *P. pourtalesii* from *P. fraterculus* in our material. We cannot emphasize too strongly, however, that measurements on the propodus and dactylus of the last walking legs be made with extreme care and accuracy in the smaller specimens, preferably under a microscope, because an error of just 0.1-0.2 mm may result in erroneous identification of such juveniles. Mature specimens, especially males of *P. pourtalesii*, offer little problem, and the gonopods in any case are distinctive (Figure 17 A-D).

We would also note that careful collecting of individuals and still more careful preservation will reward the investigator with specimens which possess most or all of their pereiopods, thus facilitating the task of identification of members of this family. In our experience, only the anomuran porcelain crabs undergo such severe autotomy during collection and subsequent preservation.

## *Parthenope granulata* (Kingsley, 1879)

Figures 23, 24 A-d, 25 A

*Lambrus granulatus* Kingsley, 1879, p. 150 [female syntype, USNM 55696, lectotype by subsequent designation by Gore, 1977; probably also male syntype, based on original description; specimen now lost].

*Platylambrus serratus*: Aurivillius, 1889, p. 59, pl. 4, fig. 8; Hay and Shore, 1918, p. 463, pl. 39, fig. 7 [not *Lambrus serratus* H. Milne Edwards, 1834].

*Parthenope (Platylambrus) crenulata*: Verrill, 1908, p. 417, pl. 28, fig. 5 [not pl. 27, as in text] [not *Lambrus crenulatus* Saussure, 1858].

*Parthenope crenulata*: Verrill, 1922, p. 155, text-fig. 12.

*Parthenope (Platylambrus) serrata*: Rathbun, 1925, p. 516 [in part, not pls. 180, 181, and pl. 275, figs. 7-10 (all = *P. serrata*)]; Boone, 1930, p. 117 [in part, probably not pl. 36, figs. A, B (= *P. serrata*)]; Springer and Bullis, 1956, p. 22 [listed]; Bullis and Thompson, 1965, p. 13 [*Silver Bay* Sta. 54, *Combat* Sta. 397 only]; Williams, 1965, p. 267, text-figs. 247, 252B.

*Parthenope (Platylambrus) granulata*: Gore, 1977, pp. 505*ff*, text-figs. 1A-d, 2A, pls. 3A, 4C, D, 5C, D.

*Material examined*: HOURGLASS STATION B: 1 cheliped; 3 January 1966; dredge; FSBC I 15068. — 1 ♂, 8.1; 18 May 1966; dredge; SIFP 89:2525. — 1 ♂, crushed; 19 November 1966; trawl; BMNH 1977:234. — 1 ♂, 7.0; 5 February 1967; dredge; SIFP 89:2911. — 1 ♂, 11.2; 11 May 1967; dredge; FSBC I 15072. — 2 ♂, 11.5-15.4; 2 June 1967; dredge; USNM 168520. — 1 ♀, 16.5; 1 July 1967; dredge; FSBC I 15073. — 1 ♀, 18.9, ovigerous; 5 October 1967; trawl; FSBC I 15074. — HOURGLASS STATION C: 1 ♂, 13.0; 20 October 1965; trawl; USNM 168517. — 1 ♂, 15.5; 8 October 1966; dredge; MNHNP acc. no. 7670-7673. — 1 ♀, 19.1; 6 November 1966; trawl; RNHL D 31406. — 1 ♀, 17.0; 1 December 1966; trawl; SIFP 89:2912. — 1 ♂, 14.0; 1 December 1966; dredge; RNHL D 31408. — 1 ♀, 12.2; 3 April 1967; dredge; FSBC I 15080. — 1 ♀, 18.1; 3 April 1967; trawl; FSBC I 15081. — 1 ♂, crushed; 11 May 1967; dredge; FSBC I 15082. — 1 ♂, 12.1; 1 ♀, 17.4; 21 June 1967; dredge; SIFP 89: 2909. — 1 ♂, molt; 11 July 1967; trawl; FSBC I 15083. — 1 ♂, crushed; 1 August 1967; trawl; FSBC I 15084. — 1 ♂, 14.1; 11 August 1967; dredge; MHNG. — 1 ♂, 16.0; 11

August 1967; trawl; MNHNP acc. no. 7670-7673. — 1 ♀, 7.9; 1 September 1967; trawl; SIFP 89:2518. — 1 ♀, 17.9; 25 October 1967; dredge; MHNG. — 1 ♂, 15.1; 25 October 1967; trawl; FSBC I 15086. — 1 ♀, 17.3; 2 November 1967; trawl; MNHNP acc. no. 7670-7673. — 1 ♀, 17.8, ovigerous; 21 November 1967; dredge; UZMC 15.I.1977. — HOURGLASS STATION D: 1 ♀, 21.9, ovigerous; 19 October 1966; dredge; SIFP 89:2513. — 1 ♀, 16.4; 7 January 1967; trawl; FSBC I 15088. — 2 ♀, 16.1-17.8, both ovigerous; 4 April 1967; dredge; USNM 168518. — 1 ♀, 6.9; 1 juv., 6.2; 12 April 1967; trawl; FSBC I 15090. — 1 ♀, molt; 21 June 1967; trawl; FSBC I 15092. — 2 ♀, (1 ovigerous, 19.3) 19.8; 21 November 1967; dredge; SIFP 89:2514. — HOURGLASS STATION J: 1 ♀, 16.5, ovigerous; 11 October 1967; dredge; BMNH 1977:236. — 1 ♂, crushed; 14 November 1967; dredge; USNM 168522. — 1 ♂, 16.0; 1 ♀, 12.4; 14 November 1967; trawl; USNM 168521. — HOURGLASS STATION K: 1 ♂, 15.2; 1 ♀, 15.4; 12 October 1966; trawl; MHNG. — 1 ♂, 17.0; 12 October 1966; dredge; RNHL D 31407. — 1 ♀, 17.5; 12 November 1966; trawl; FSBC I 15101. — 1 ♂, crushed; 15 May 1967; trawl; USNM 168519. — 3 ♀, 7.4-16.5; 6 June 1967; dredge; SIFP 89:2516. — 1 ♂, 5.3; 5 July 1967; dredge; SIFP 89:2913. — 1 ♀, 17.0; 4 September 1967; trawl; FSBC I 15103. — 2 ♀, 15.7-17.9; 4 September 1967; dredge; MNHNP acc. no. 7670-7673. — 3 ♂, 15.2-17.7; 3 ♀, (1 ovigerous, 15.6) 16.5, crushed; 11 October 1967; trawl; SIFP 89:2517. — 1 ♀, 16.5, ovigerous; 11 October 1967; dredge; SIFP 89:2515. — 2 ♀, 15.7-16.1; 14 November 1967; trawl; RNHL D 31409. — 2 ♀, 15.9-16.2; 14 November 1967; dredge; USNM 168523. — EAST FLORIDA: RSP STATION 01A: 2 ♂, 13.4-17.6; FSBC I 10935; 1 ♀, 19.5; FSBC I 10936; 2 July 1973; trawl. — RSP STATION 001: 1 ♂, 9.4; 4 June 1974; trawl; SIFP 89:2076. — RSP STATION 002: 1 ♀, 20.0; 16 January 1973; trawl; FSBC I 9789. — RSP STATION 003: 1 ♂, 10.3; MNHNP acc. no. 7675; 1 ♀, 14.3; MHNG; 18 July 1974; trawl. — 1 ♂, 13.1; FSBC I 10938; 2 ♀, 14.5-14.8; MNHNP acc. no. 7674; 1 ♀, 18.7; UZMC 15.I.1977; 15 August 1973; trawl. — 1 ♀, 12.8; BMNH 1977:235; 1 ♂, damaged; 1 ♀, 16.6; SIFP 89:1985; 30 June 1973; trawl. — RSP STATION 004: 1 ♂, 12.4; 1 ♀, 18.5; 1 July 1973; trawl; SIFP 89:1991. — 1 ♀, 18.0; 13 August 1973; trawl; FSBC I 10937. — 1 ♀, 19.0; 15 May 1974; trawl; SIFP 89:1438. — 1 ♀, 8.7; 5 June 1974; trawl; UZMC 15.I.1977. — 1 ♂, damaged; 15 August 1974; trawl; SIFP 89:1537. — RSP STATION 005: 1 ♀, 18.5; FSBC I 9778; 1 ♀, 20.6, ovigerous; FSBC I 9782; 5 March 1973; trawl. — 1 ♀, 18.5; 4 April 1973; trawl; FSBC I 9850. — RSP STATION 222: 1 ♀, 18.8, ovigerous; 13 September 1973; trawl; SIFP 89:1992. — RSP STATION 262: 1 ♂, damaged; 19 June 1973; trawl; FSBC I 10934. — R/V GOSNOLD STATION 237/514: 1 ♂, 15.3; 12 June 1974; trawl; SIFP 89:1154. — R/V JOIE DE VIVRE STATION: 1 ♂, 19.0; 13 July 1973; 27°28′N, 79°57′W to 27°32′N, 80°01′W; 70 m; 8 ft otter trawl; SIFP 89:0692.

*Diagnosis*: Carapace moderately flattened, noticeably tuberculate, hepatic regions rounded, continuing arc of anterolateral region; large, acuminate spine directed obliquely posteriad at posterolateral angle; suborbital and subhepatic regions deeply excavated; angle formed by posterolateral spine, gastric tubercle, and outer orbital margin 90° or nearly so. Chelipeds from 2.5 times to over 3 times as long as carapace; row of alternately large and small, triangular to lanceolate, outwardly directed spines along outer margin of manus. Major gonopod elongate, narrowing to truncate tip, heavily dentate and spinose laterally and ventrally, tip and outer face naked; gonopore with noticeable shelf-like projection above, giving opening semilunar aspect.

*Description*: Carapace rounded, nearly subcircular anteriorly, moderately depressed, about 1.2 to 1.3 times as wide as long (SCW:RCL) in adults; anterolateral margin of hepatic and branchial regions very convex, especially in larger individuals; long, flattened, acuminate or blunt spine, often foliate along lateral margin, directed obliquely posteriad at posterolateral angle; posterolateral margin oblique to slightly concave; posterior margin wide, rounded to angularly convex. Surface of carapace distinctly punctate, with roughened elevations on gastric, branchial, cardiac and intestinal regions; latter ornamented with single large, and several smaller, granulate tubercles, especially on midline and long crests of branchial ridges, with many low,

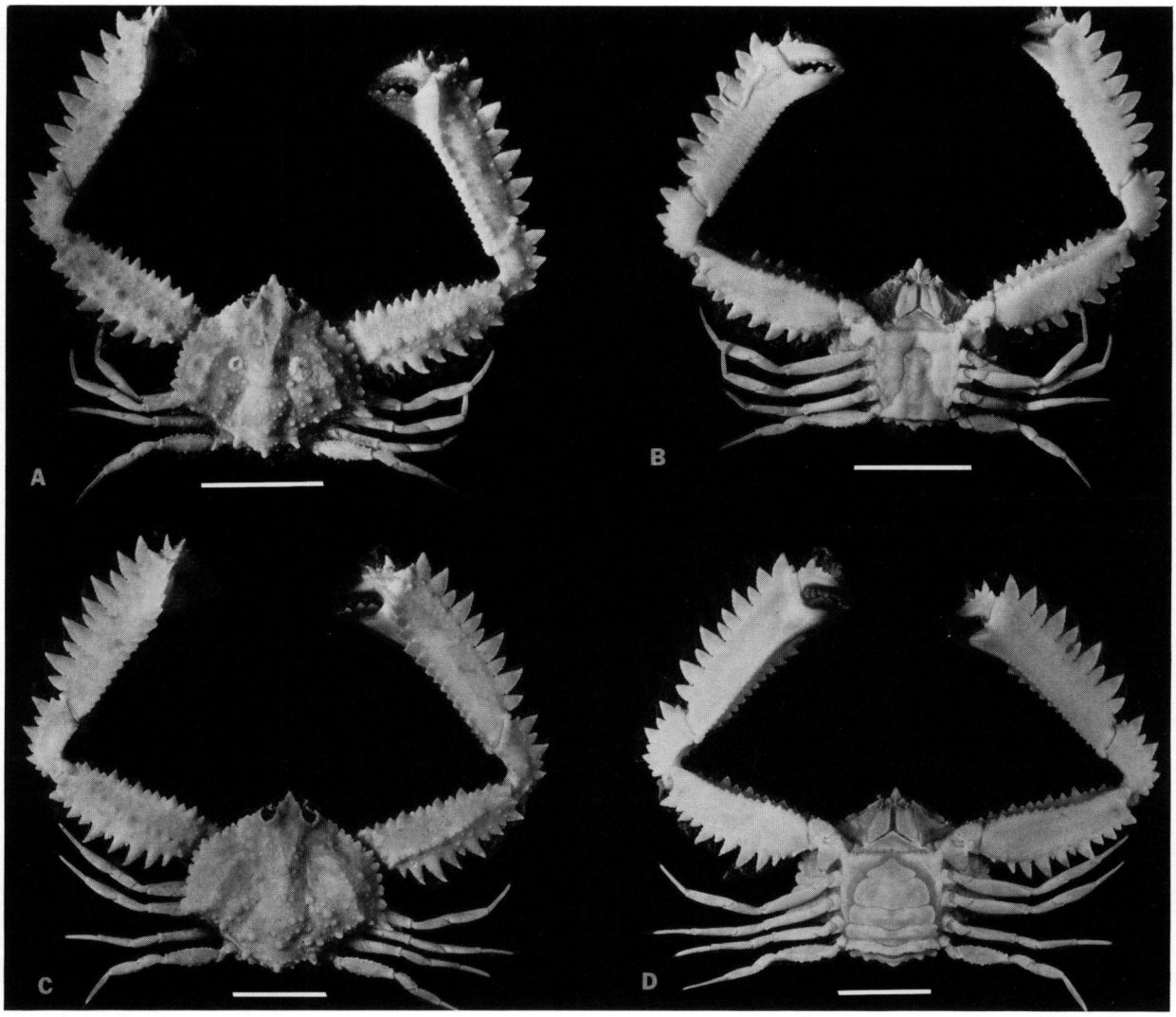


Figure 23. *Parthenope granulata* (Kingsley). A. male, off Sebastian Inlet, Florida east coast, dorsal view; B. same, ventral view; C. female, off Cape Canaveral, Florida east coast, dorsal view; D. same, ventral view. Scale lines = 10 mm. (After Gore, 1977).

less distinct tubercles and granules interspersed between. Angle formed by posterolateral spine, large gastric tuberculation, and outer orbital margin equaling 90° or nearly so. Gastric and branchial regions separated by deep depression; separations between hepatic and metabranchial regions less depressed. Rostrum short, tooth-like, bluntly rounded distally, faintly channeled, tridentate; lateral teeth well-developed; single, narrower tooth below and outside of each lateral tooth. Seven or eight (rarely up to ten) triangular, single,distinctly bifid, or multidentate teeth on branchial margin in advance of lateral spine; fourth or fifth tooth from orbit, on anterolateral angle, often larger than others; margins of teeth granulate in young, becoming dentate with maturity. Seven larger granulate tubercles on posterior and posterolateral margins; tubercles usually straight, directed more or less obliquely outward, but curved anteriorly in some individuals; longitudinal or oblique row of of smaller granules or tubercles extending anteriorly from each tooth-like tubercle in adults; row obsolete in subadults, sometimes absent in juveniles. Pterygostomian and subhepatic

regions excavated as channel extending to infero-exterior margin of orbit. Distinct sub-branchial spine present. Outer maxillipeds lightly granulate; inner margin bluntly dentate, especially in large specimens.

Chelipeds long, 2.5 to more than 3 times RCL, flattened, appearing triangular in cross-section. Hand with lower face glabrous, lower margin dentate; outer margin coarsely serrate, with nine or ten alternately large and small, acutely triangular or lanceolate teeth, directed outward or obliquely forward; teeth on inner margin of hand smaller, more numerous (15 or 16, often bifid or trifid), widely triangular, with crenulate margins; upper surface of manus with few low, scattered tubercles. Wrist smooth, outer margin sharply dentate, row of granules on inner margin, several larger granulose elevations dorsally. Arm with numerous bluntly triangular teeth anteriorly, about ten long, large, sharply conical teeth posteriorly, latter usually directed outward or curved toward wrist; upper surface of merus with longitudinal row of raised tubercles mesially, curving gently toward anterodistal angle; other more or less isolated tubercles scattered irregularly over meral surface. Walking legs smooth to moderately spinulose, especially meri of males and last pair of legs in both sexes; first pair of legs not reaching end of arm.

Abdomen of male with somites 3-5 fused, sixth usually with median spine or tubercle, rarely absent or obsolete. Female abdomen with distinctly raised, rounded, transverse carinae on somites 1-3. Gonopods and gonopores as illustrated (Figures 24 A-d, 25 A).

*Type-locality*: Tortugas, Florida; 9 fms (16 m); lectotype female by subsequent designation USNM 55696 (Gore, 1977).

*Distribution*: Bermuda; Cape Hatteras, North Carolina around peninsular Florida to off Louisiana in the northwestern Gulf of Mexico; Cuba?; St. Thomas, Virgin Islands; 7-73 m; to at least 677 m if R/V *Oregon* Station 635 data are not in error. Hourglass Stations B, C, D, J and K; 18-55 m.

*East Pacific analogue*: None.

*Remarks*: This species is morphologically similar to *Parthenope serrata*, which accounts for relegation of *P. granulata* to its synonymy for so many years. The importance of gonopod morphology studies in decapod crustaceans is further emphasized in the rediscovery of the validity of *P. granulata*, which differs most noticeably from *P. serrata* in gonopod structure; gonopore differences are also evident as can be seen in the accompanying illustrations (Figure 25). Indeed, had Williams (1965) not figured the gonopods which he attributed (erroneously as it turns out) to *P. serrata*, *P. granulata* might yet have gone undiscovered. It was only by purest serendipity that the specimen we chose for illustration of gonopod structure was one which differed noticeably from those illustrated by Williams, thus prompting further examination of our material, ultimately revealing the existence of *P. granulata*. In this regard it was interesting to note Verrill's (1908) comments on the differences between his *P. crenulata* [= *P. granulata*] from Bermuda and the somewhat stylized illustration of *P. serrata* provided by A. Milne Edwards (1878). Verrill was not the only one to notice differences between collected material and A. Milne Edwards' figures. Notes made by Leo Zehntner on a syntype of Saussure's *Lambrus crenulatus* indicated that Zehntner did not agree with A. Milne Edwards' synonymizing of Saussure's species with *P. serrata*. We have seen photographs of Saussure's syntype, a juvenile female, and the cheliped armature is noticeably different from that figured by A. Milne Edwards (1878) for *P. serrata*, and instead trends toward the armature seen in *P. granulata*. However, the carapace is unquestionably that of *P. serrata*. Part of Zehntner's confusion may also have arisen in comparing his

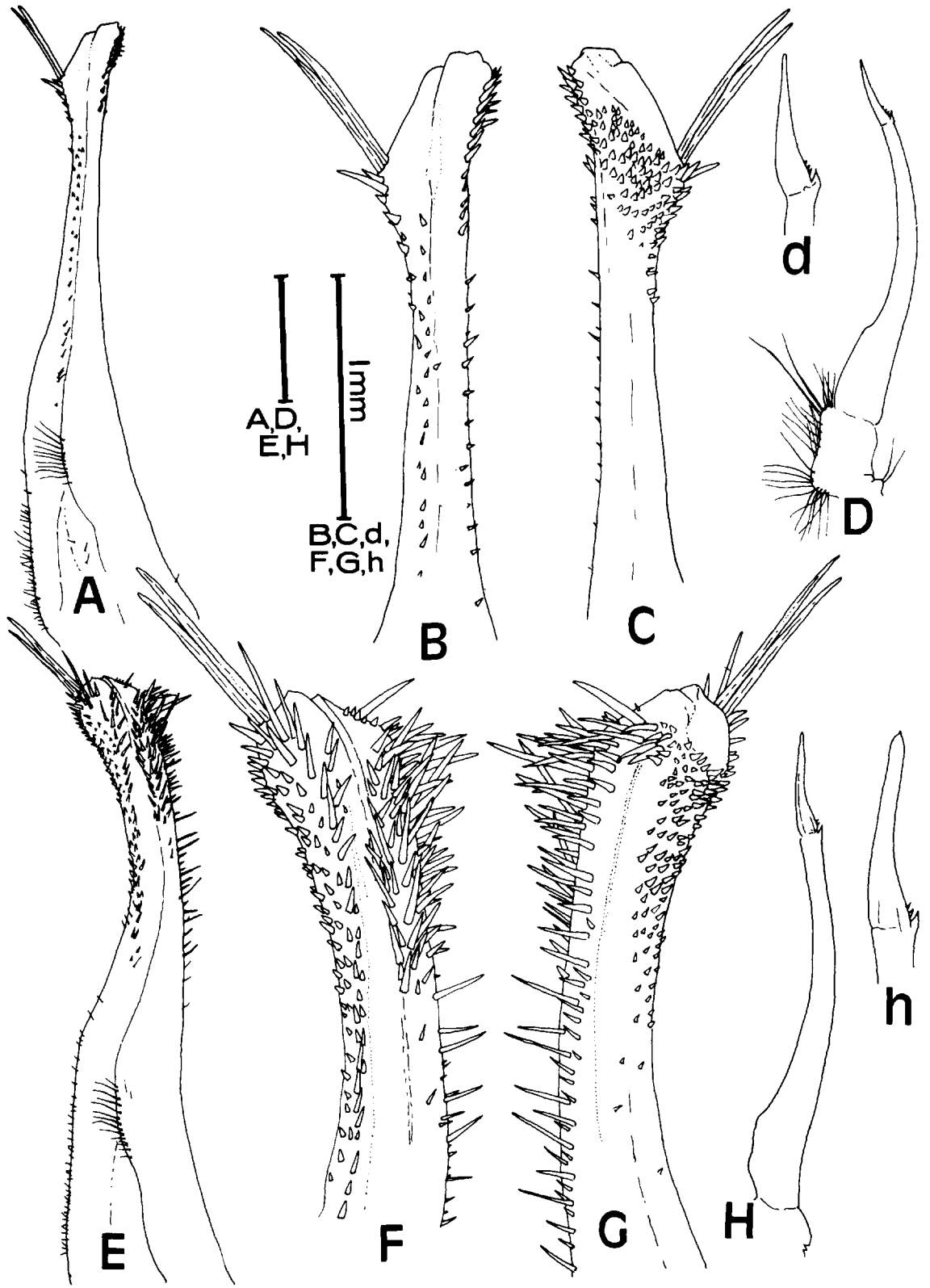


**Figure 24.** Major and minor gonopods (pleopods 1 and 2) of male *Parthenope. Parthenope granulata* (Kingsley), Atlantic specimen: A. SIFP 89:1537, major gonopod, medial view; B. same, detail of distal portion; C. same, ventral view, detail of distal portion; D. minor gonopod, mesiolateral view; d. same, detail of distal portion. *Parthenope serrata* (H. Milne Edwards), Gulf of Mexico specimen: E. MHNG, major gonopod, medial view; F. same, detail of distal portion; G. same, ventral view, detail of distal portion; H. minor gonopod, mesiolateral view; h. same, detail of distal portion. (After Gore, 1977).

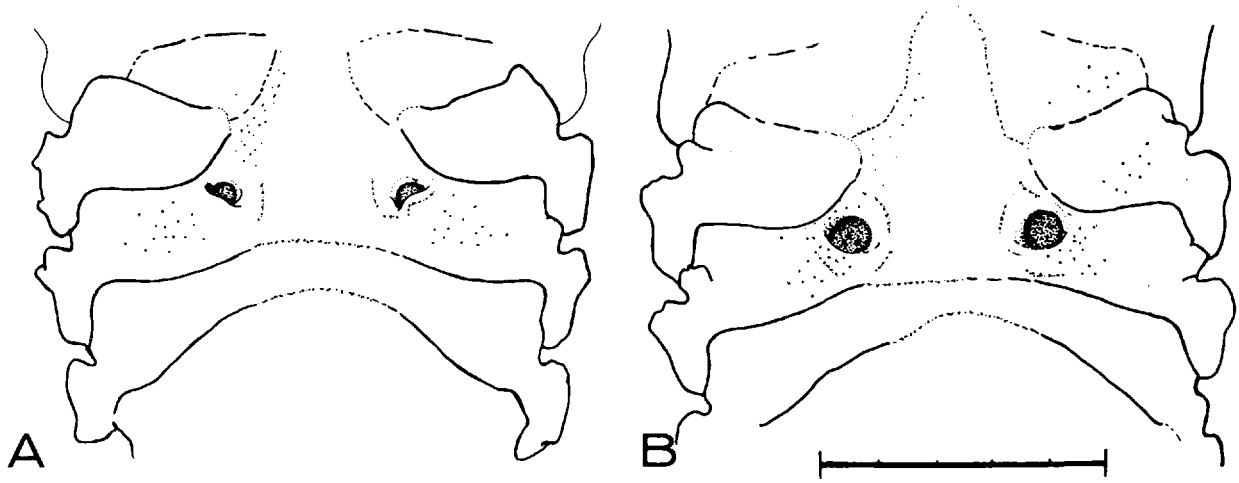


Figure 25. Gonopores of female *Parthenope*, Gulf of Mexico specimens. A. *Parthenope granulata* (Kingsley), SIFP 89:2912; B. *Parthenope serrata* (H. Milne Edwards), SIFP 89:2906. Scale line = 5 mm. (After Gore, 1977).

specimens to Saussure's figure of *L. crenulatus*. The illustration is most definitely that of *P. serrata*, and a larger, probably adult specimen as well, and bears little resemblance to the apparently sole surviving juvenile syntype. The latter specimen of *L. crenulatus* and the resultant taxonomic confusion have been considered at length in another paper (Gore, 1977).

Kingsley's (1879) *Lambrus granulatus* was established on a juvenile male, and a subsequently noted (Rathbun, 1925) female "cotype". The former specimen is apparently lost (H. Levi, in litt.) and the latter specimen, also a juvenile, has been designated as lectotype (Gore, 1977).

It is interesting that neither *P. granulata* nor its close relative, *P. serrata*, have eastern Pacific analogues, although *Parthenope depressiuscula* (Stimpson, 1871) is superficially similar morphologically.

It is possible that some Hourglass specimens discarded as "*P. serrata*" before we received the remaining material were actually *P. granulata*. The discarded material is listed in the account of *Parthenope incertae sedis*.

## *Parthenope serrata* (H. Milne Edwards, 1834)

Figures 24 E-h, 25 B, 26

*Lambrus serratus* H. Milne Edwards, 1834, p. 357; Holthuis, 1959, p. 191. not *Lambrus serratus*: White, 1847, p. 12 [= *Lambrus hoplonotus* var. *granulosus* Miers, 1879].

*Lambrus lupoides* White, 1847, p. 12 [*nomen nudum*; specimen *c*, as restricted by Gore, 1977].

*Lambrus crenulatus* Saussure, 1858, p. 429 [13], pl. 1, fig. 4, 4a; Gundlach and Torralbas, 1899, pp. 301, text-fig. (33) p16, 303 [in reprint, 1917, p. 12, pl. [2], fig. 5].

*Lambrus melanodactylus* Desbonne, *in* Desbonne and Schramm, 1867, p. 21 [manuscript name].

*Platylambrus serratus*: A. Milne Edwards, 1878, p. 156, pl. 30, fig. 1-1c [lectotype (by subsequent designation by Gore, 1977) illustrated]; Rathbun, 1901, p. 80.

*Lambrus* (*Lambrus*) *serratus*: Young, 1900, pp. 102 [key], 105.

*Parthenope* (*Platylambrus*) *serrata*: Rathbun, 1919, p. 346; 1925, p. 516 [in part], pls. 180, 181, pl. 275, figs. 7-10 [after A. Milne Edwards, 1878; lectotype by subsequent designation]; Boone, 1930, p. 117 [in part, probably including pl. 36, figs. A, B]; Chace, 1956, p. 162 [in part, USNM specimens]; Bullis and Thompson, 1965, p. 13 [in part, *Oregon* stations and *Silver Bay* Sta. 71 only]; Leary, 1967, pp. 45 [unnumbered text-fig.], 50 [listed]; Yang, 1971, p. 166, figs. 1-9 [larval development]; Felder, 1973, p. 45 [key], pl. 6, fig. 8 [right chela]; Zeiller, 1974, p. 100, color plate; Gore, 1977, pp. 505*ff*, text-figs. 1E-h, 2B, pls. 1, 2 [*L. crenulatus* syntype], 3B [*L. lupoides*], 4A, B, 5A, B.

*Lambrus* (*Platylambrus*) *serratus*: Flipse, 1931, p. 93.

not *Parthenope* (*Platylambrus*) *serrata*: Williams, 1965, p. 267, text-figs. 247, 252B [= *P. granulata* (Kingsley, 1879)].

*Material examined*: HOURGLASS STATION A: 1 ♂, 16.7; 2 November 1967; dredge; MNHNP acc. no. 7676. — HOURGLASS STATION B: 1 ♂, 8.1; 1 August 1966; dredge; SIFP 89:2907. — 1 ♂, 8.3; 18 October 1966; dredge; SIFP 89:2905. — 1 ♀, crushed; 6 November 1966; trawl; USNM 156503. — 2 ♂, 15.8-17.7; 1 ♀, 15.6; 2 November 1967; dredge; SIFP 89:2509. — HOURGLASS STATION C: 2 ♀, (1 ovigerous, 15.9) 16.0; 8 November 1965; dredge; FSBC I 1134. — 1 ♀, 17.6, ovigerous; 3 December 1965; dredge; FSBC I 1367. — 1 ♀, 15.8, ovigerous; 13 December 1966; dredge; USNM 156504. — 1 juv., crushed; 5 February 1967; dredge; MNHNP acc. no. 7677. — 1 ♂, molt; 1 ♀, 7.4; 2 March 1967; trawl; USNM 156505. — 1 ♀, 17.4; 21 June 1967; dredge; SIFP 89:2511. — 1 ♀. 10.3; 21 November 1967; trawl; SIFP 89:2520. — HOURGLASS STATION D: 1 ♀, 13.3; 21 October 1965; trawl; FSBC I 981. — 1 juv., crushed; 6 February 1967; dredge; RNHL D 31410. — 2 ♀, 9.6, crushed; 21 May 1967; dredge; FSBC I 15091 (lost). — HOURGLASS STATION I: 2 ♀, 20.7-21.8, both ovigerous; 3 September 1965; trawl; FSBC I 865. — 1 ♂, 16.5; 2 ♀, 16.5-20.4; 5 August 1966; trawl; FSBC I 3680. — 1 ♀, crushed; 15 February 1967; dredge; RNHL D 31413. — 1 ♂, 19.9; 4 September 1967; dredge; RNHL D 31411. — 1 ♂, 18.1; 11 October 1967; dredge; USNM 156507. — 1 ♂, 21.1; 1 ♀, 22.1; 14 November 1967; dredge; MHNG. — HOURGLASS STATION J: 1 ♂, 15.5; 1 ♀, 19.3; 12 November 1965; trawl; FSBC I 1163. — 2 ♀, (1 ovigerous, 18.9) 16.6; 14 February 1966; trawl; FSBC I 1988. — 1 ♂, 17.8; 12 October 1966; trawl; RNHL D 31412. — 1 ♂, 19.4; 2 ♀, 19.3-19.8; 12 October 1966; dredge; UZMC 15.I.1977. — 1 ♂, 18.9; 12 November 1966; trawl; UZMC 15.I.1977. — 1 ♂, 19.8; 1 ♀, 19.4; 12 November 1966; dredge; MHNG. — 1 ♀, 17.7; 15 May 1967; dredge; SIFP 89:2906. — 1 ♀, 19.5; 11 October 1967; trawl; MNHNP acc. no. 7678. — 1 ♀, 18.8; 14 November 1967; trawl; USNM 156508. — HOURGLASS STATION K: 1 ♀, 17.0; 4 December 1966; trawl; USNM 156502. — 1 ♀, 10.3; 5 July 1967; trawl; USNM 156506. — HOURGLASS STATION L: 1 ♀, 20.5; 5 September 1966; dredge; FSBC I 4273. — 1 ♀, 7.3; 16 February 1967; dredge; MHNG. — EAST FLORIDA: JOIE DE VIVRE STATION: 1 ♂, 10.6; 11 July 1973; Capron Shoal, off Ft. Pierce, 10 m; Kirtley dredge; SIFP 89:0733.

*Diagnosis*: Carapace flattened, noticeably tuberculate and granulate, about 1.35 times wider than long; hepatic regions obliquely rounded, interrupting continuing arc of anterolateral region; long, large, usually acute spine at posterolateral angle, directed laterally; suborbital and subhepatic regions deeply and smoothly excavated; angle formed by posterolateral spine, gastric tubercle and outer orbital margin always much less than 90°. Chelipeds 2.5 to over 3 times as long as carapace; row of alternately large and small, acutely triangular spines along outer margin of manus, curved on posterior margins, with tips directed more or less toward fingers. Major gonopod bluntly truncate, club-shaped, heavily spinose and dentate over nearly entire tip distally; gonopore flattened against plane of sternum, rounded, exposed, without shelf-like projection.

*Description*: Carapace in general angularly rounded, subcircular, depressed, approximately 1.3-1.4 times as wide as long (SCW:RCL) in adults; anterolateral margin of hepatic region somewhat oblique, becoming