A Review of the Grapsid Crab Genus *Sesarma* (Crustacea: Decapoda: Grapsidae) in America, with the Description of a New Genus

LAWRENCE G. ABELE

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ABSTRACT

Abele, Lawrence G. A Review of the Grapsid Crab Genus *Sesarma* (Crustacea: Decapoda: Grapsidae) in America, with the Description of a New Genus. *Smithsonian Contributions to Zoology*, number 527, 60 pages, 41 figures, 1 table, 1992.—All 39 species of *Sesarma* reported from the Americas were examined, and 23 of these are considered valid. The genus *Sesarma* is here restricted to the Americas, and the following species are assigned to this genus: *reticulatum* (the type species), *crassipes, curacaoense, rectum, bidentatum, jarvisi, cookei, verleyi, aequatoriale, sulcatum, rhizophorae,* and *rubinofforum.* A new genus, *Armases,* is described; *Sesarma cinereum* is the type species. The following species previously assigned to *Sesarma* are assigned to this new genus: *benedicti, ricordi, americanum, roberti, angustipes, miersii, angustum, occidentale, gorei,* and *magdalenense* from the Americas and *elegans* from the eastern Atlantic. All American species are illustrated, and keys for their identification are provided.

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Contents

A Review of the Grapsid Crab Genus *Sesarma* (Crustacea: Decapoda: Grapsidae) in America, with the Description of a New Genus

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Introduction

The grapsid crab genus *Sesarma* (sensu lato) consists of more than 125 species in temperate and tropical regions of the world. Species occur in a variety of environments including intertidal marine, brackish water, freshwater, and terrestrial habitats (see "Ecological Notes"). In the Americas they occur on the east coast from Massachusetts to the lower coast of Brazil including the Gulf of Mexico and on the west coast from Baja California, Mexico, to Peru.

The genus was created by Say (1817) with *Ocypode reticulatus* Say, 1817, as the type species. Since then species assigned to the genus have been reassigned to no less than 20 other genera or subgenera. The result is systematic and nomenclatural confusion (see Manning and Holthius, 1981:241). The American species of *Sesarma* have traditionally been placed in two subgenera, *Sesarma* and *Holometopus* (= *Chiromantes*, see Holthuis, 1977). Serène and Soh (1970) described, from the Indo-West Pacific, a number of new genera allied to *Sesarma* and tentatively placed two Jamaican species (*S. jarvisi* and *S. verleyi*) in their new genus *Sesarmoides* (type species *Sesarma krausii*). In my opinion, these two species belong in the genus *Sesarma* and form part of a morphological continuum of species that range from aquatic to terrestrial habits in Jamaican sesarmids (see Hartnoll, 1964b, 1965). Von Hagen (1978) redefined the subgenus *Sesarma* and showed that some species previously in the subgenus *Holometopus* should be in the subgenus *Sesarma*. The data presented by von Hagen (1978) support the recognition of two groups of American species, one in the subgenus *Sesarma* and the other in *Chiromanetes*. It is not clear from the material that I have examined (which included almost all type species of sesarmid genera and subgenera) that the American species previously referred to *Holometopus* are sufficiently similar to *Sesarma haematocheir* (the type species of *Chiromantes*) to warrant their inclusion in the same taxonomic unit (see also von Hagen, 1978:52). Therefore, at the cost of adding to an already substantial synonymy, I will treat these species as belonging to a distinct genus described herein.

In the synonymy of *Sesarma*, I have followed Manning and Holthuis (1981:241) and listed all genera and subgenera whose species had previously been referred to *Sesarma*. I am sure that some of these will be recognized as valid in the future.

Table 1 lists all species of *Sesarma* reported from the Americas and their current status. Although 39 species have been reported, only 23 are considered valid. The synonymies for the species are not intended to be complete but refer to major papers dealing with the American fauna. Several taxonomic problems have been inadequately addressed here. It is highly likely that the species referred to herein as *Armases miersii* and *A. angustipes* require further study. These two species are very similar morphologically, and some specimens can be identified only tentatively as one or the other. Populations of *Sesarma curacaoense* and *S. reticulatum* appear to merge morphologically along the east coast of Florida, and Darryl L. Felder (University of Southwestern Louisiana, pers. comm.) has pointed out that *S. reticulatum* consists of two distinct color forms in the Gulf of Mexico. Two species, *Armases cinereum* and *A. ricordi*, show considerable variation over their geographic ranges, and it is possible that each actually comprises more than one species.

ABBREVIATIONS.—The following acronyms and abbreviations are used: AHF, the Allan Hancock Foundation, Los Angeles; AMNH, the American Museum of Natural History, New York; BMNH, the Natural History Museum, London (formerly the British Museum (Natural History)); cb = carapace breadth at the midline; cl, carapace length; iw, interorbital width (or width of the frontal region); LGA, personal collection of author; MCZ, the Museum of Comparative Zoology, Harvard University, Cambridge; MIZS, the Museo ed Istituto

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di Zoologica Sistematica di Torino, Turin; ml, meral length; mw, meral width; MZ, Musée Zoologique de l'Université Louis Pasteur, Paris; RMNH, the Rijksmuseum van Natuurlijke Historie, Leiden; UMML, the University of Miami Marine Laboratory, Miami; UPRC, the University of Panama Reference Collection; USNM, collections of the former United States National Museum, now deposited at the National Museum of Natural History, Smithsonian Institution, Washington, D.C.; YPMNH, the Yale Peabody Museum of Natural History, New Haven.

All material will be deposited in the National Museum of Natural History, Smithsonian Institution, unless otherwise stated.

ACKNOWLEDGMENTS.—I thank Dr. F. Douin, Curator of the Musée Zoologique de l'Université Louis Pasteur, Strasbourg, for the loan of syntypes of *S. aequatoriale;* Ms. Janet Haig of the Allan Hancock Foundation, Los Angeles, for the loan of material; Dr. R. Manning and Mr. C.A. Child of the National Museum of Natural History, Washington, D.C., for the loan of material and for assisting me during a visit to that institution; Dr. H. Levy of the Museum of Comparative Zoology, Cambridge, for assistance during a visit to that institution; Mr. H. Feinberg of the American Museum of Natural History, New York, for assistance during a visit to that institution; Dr. Orsetta Elter, Curator of the Museo ed Istituto di Zoologica Sistematica della Universita di Torino for his patience, time, and trouble involved in my numerous requests for material; and Dr. W.T. Hartman, Yale University, for his hospitality during my visit and for answering requests for material. Support and facilities for some of the field work were provided by the Smithsonian Tropical Research Institute, Panama, and I thank Dr. Ira Rubinoff for his help. Support was provided by the National Science Foundation. The illustrations were rendered by Ms. Teresa C. Ellis and Ms. Lilly K. Manning.

Genus *Sesarma* Say, 1817

Sesarma Say, 1817:76 [type species: *Ocypode reticulatus* Say, 1817, by monotypy; gender: neuter].

Pachysoma de Haan, 1833:5 [circ. pl. 2, pl. 7: fig. 4, pl. 8: fig. 3. Invalid junior homonym of *Pachysoma* MacLeay, 1821 (Coleoptera); type species: *Grapsus (Pachysoma) haematocheir* de Haan, 1833, by selection by Holthuis (1977:170); gender: neuter].

Chiromantes Gistel, 1848:x [substitute name for *Pachysoma* de Haan, 1833; type species: *Grapsus (Pachysoma) haematocheir* de Haan, 1833; gender: masculine].

Holometopus H. Milne Edwards, 1853:187 [type species: *Grapsus (Pachysoma) haematocheir* de Haan, 1833, by monotypy; gender: masculine].

Geosesarma De Man, 1892b:341 [type species: *Sesarma (Geosesarma) nodulifera* De Man, 1892b, selected by Serène and Soh (1970:402); gender: neuter].

Episesarma De Man, 1895:165 [type species: *Sesarma taeniolatum* Miers, 1877 (= *Sesarma taeniolata* White, 1847, a nomen nudum), a subjective junior synonym of *Sesarma mederi* H. Milne Edwards, 1853, selected by Holthuis (1978:24); gender: neuter].

Parasesarma De Man, 1895:181 [type species: *Cancer quadratus* Fabricius, 1798 (not Fabricius, 1787) (= *Ocypode plicata* Latreille, 1803), by selection by Rathbun, 1918:284); gender: neuter].

Perisesarma De Man, 1895:208 [type species: *Sesarma (Perisesarma) eumolpe* De Man, 1895, selected by Holthuis (1977:170); gender: neuter].

Baenium Serène and Soh, 1970:389, 394 [type species: *Sesarma batavica* Moreira, 1903, by original designation; gender: neuter].

Neosesarma Serène and Soh, 1970:389, 394 [type species: *Sesarma gemmiferum* Tweedie, 1936, by original designation; gender: neuter].

Neoepisesarma Serène and Soh, 1970:390, 395 [type species: *Sesarma mederi* H. Milne Edwards, 1853, by original designation; gender: neuter].

Muradium Serène and Soh, 1970:390, 396 [type species: *Cancer tetragonus* Fabricius, 1798, by original designation; gender: neuter].

Selatium Serène and Soh, 1970:390, 397 [type species: *Sesarma brockii* De Man, 1887, by original designation; gender: neuter].

Tiomanum Serène and Soh, 1970:391, 398 [type species: *Sesarma indica* H. Milne Edwards, 1837, by original designation; gender: neuter].

Bresedium Serène and Soh, 1970:391, 399 [type species: *Sesarma edwardsii brevipes* De Man, 1889, by original designation; gender: neuter].

Pseudosesarma Serène and Soh, 1970:391, 399 [type species: *Sesarma edwardsi* De Man, 1888, by original designation; gender: neuter].

Sesarmops Serène and Soh, 1970:391, 400 [type species: *Sesarma impressa* H. Milne Edwards, 1837, by original designation; gender: masculine].

Labuanium Serène and Soh, 1970:392, 401 [type species: *Sesarma polita* De Man, 1888, by original designation; gender: neuter].

Sesarmoids Serène and Soh, 1970:392, 401 [type species: *Sesarma krausii* De Man, 1887, by original designation; gender: masculine].

Namlacium Serène and Soh, 1970:392, 401. Type species: *Sesarma crepidatum* Calman, 1925, by original designation; gender: neuter].

DIAGNOSIS.—Carapace slightly broader than long (average cl/cb ratio about 0.9); regions defined; outer orbital angle sharp; either an anterolateral tooth or distinct stria posterior to outer orbital angle. Verwey's groove on epistome well defined, smooth, bordered by distinct row of hairs on upper and lower margin. Merus of cheliped with row of granules on posteriodistal margin ending proximal to distal margin; palm with single row of closely set granules on superior surface extending from proximal to distal margin; movable finger with row of sharp tubercles, not broadened at base. Second walking leg with dense soft pubescence on dorsal surface of propodus (though reduced in terrestrial species). (Modified after von Hagen, 1978).

The genus *Sesarma* includes the type species, *S. reticulatum,* as well as the following species, all from the Americas: *aequatoriale, bidentatum, cookei, crassipes, curacaoense, jarvisi, rectum, rhizophorae, rubinofforum, sulcatum,* and *verleyi.* All of the remaining American species, including *S. elegans* Herklots, 1851, from the eastern Atlantic, form a second group of species that is here placed in a new genus, *Armases.*

Armases, new genus

DIAGNOSIS.—Carapace slightly broader than long to slightly longer than broad; regions weakly defined; outer orbital angle sharp; anterolateral margin smooth, or slight emargination posterior to outer orbital angle; Verwey's groove on epistome poorly defined, bordered by distinct row of hair on lower

FIGURE 1.—*Sesarma reticulatum*, male, Dauphin Island, Alabama.

margin only. Merus of cheliped with row of granules on posteriodistal margin extending to distal margin; palm with scattered granules on dorsal surface; movable finger often broadened at base with scattered granules on dorsal surface. Second walking legs with no pubescence on dorsal surface of propodus.

TYPE SPECIES.—*Sesarma cinereum* Bosc, 1802.

ETYMOLOGY.—An anagram derived from *Sesarma*. Gender neuter.

REMARKS.—Species included are *americanum, angustipes, angustum, benedicti, cinereum, gorei, magdalenense, miersii, occidentale, ricordi, roberti,* all from the Americas, and *elegans* (Herklots, 1851) from the eastern Atlantic.

The genus *Armases* is in the subfamily Sesarminae of the Grapsidae. Excluding the extensive subdivisions of the genus *Sesarma,* there are approximately 10 other genera in this subfamily. *Armases, Sesarma* (sensu lato), and *Sarmatium* form a group characterized by (1) the presence of lines or ridges on the pterygostomial region, which are lined with geniculate setae, and (2) the formation of the ventral margin of the orbit by the basal portion of the antennae (see figs. 1, 2 of Felgenhauer and Abele, 1983). *Sarmatium* is distinguished from both *Armases* and *Sesarma* by its arcuate (rather than quadrate) anterior caparace region and its obliquely (rather than sharply) deflexed frontal region.

Sesarma is a large genus that has already been subdivided, and the question arises as to the relationship of *Armases* to those genera already established. I have examined the type species of all these subgenera, including *Chiromantes haematocheir* (De Haan), thought to be closely related to species now assigned to *Armases. Armases* is distinguished from all *Sesarma* (sensu lato) by the lateral margins of its carapace, which are continuous posterior to the outer orbital angle (i.e., the margin is not dentate), and by the dorsal surface of the palm, which is smooth or granulate but never has distinct ridges. *Chiromantes,* the subgenus to which the American species had previously been assigned, has *C. haematocheir* (De Haan) as the type species. Von Hagen (1978) has already noted that this species is unlike any American species. *Chiromantes haematocheir* can be easily distinguished from all American species by the presence of low, amber-colored transverse ridges on the dorsal surface of the movable finger. Each ridge appears to consist of two or three partially coalesced granules. No species of *Armases* has anything resembling ridges on the movable finger. In addition, Verwey's groove is very well defined in *Chiromantes* and poorly defined in *Armases.*

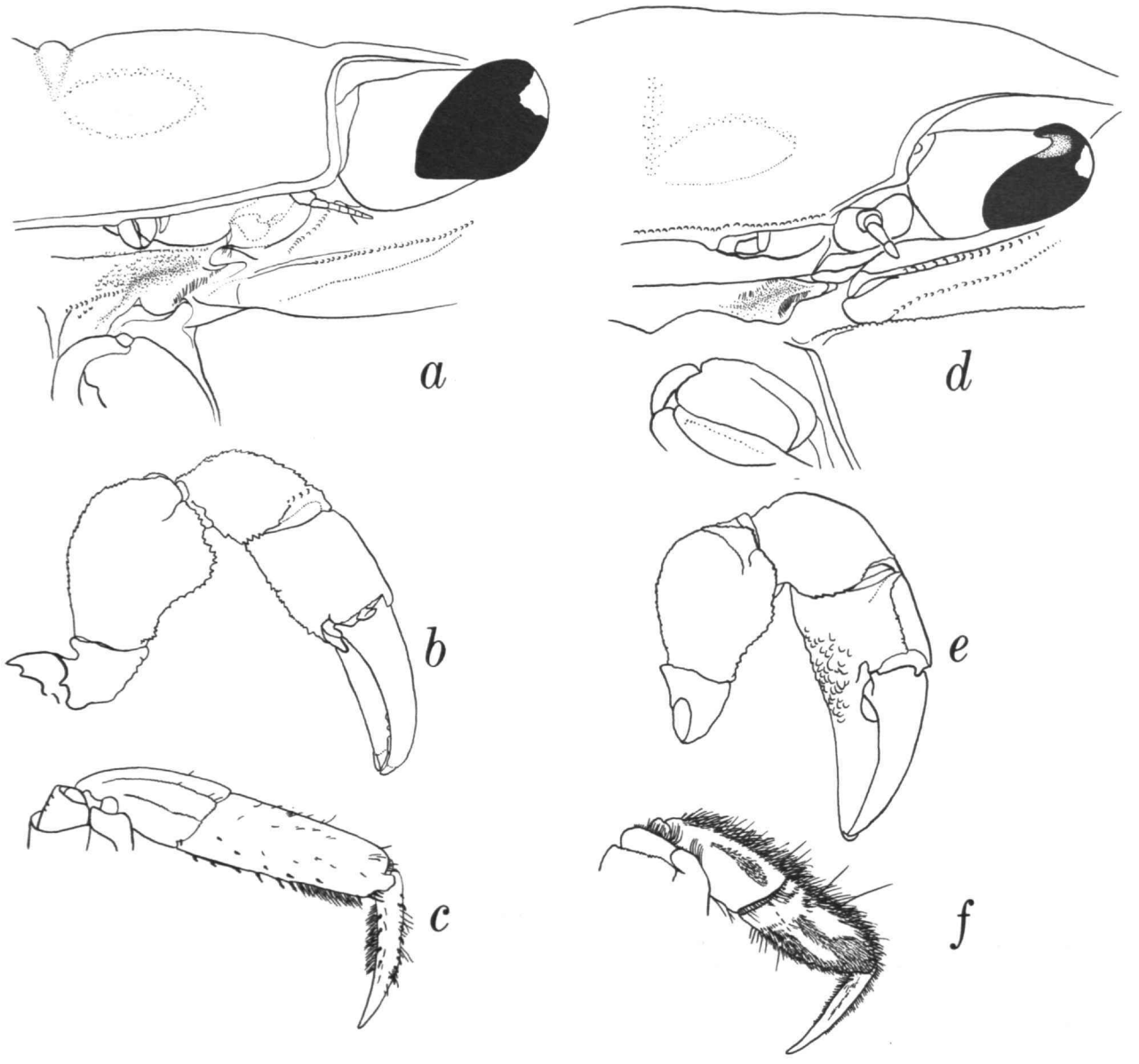

FIGURE 2.—*a–c, Armases cinereum; d–f, S. reticulatum. a, d,* Verwey's groove; *b, e,* male left chela; *c, f,* second walking leg.

Key to *Sesarma* and *Armases*, new genus

Dorsal surface of palm with carina composed of single row of sharp tubercles . . . . . ***Sesarma***

Dorsal surface of palm with scattered granules, no distinct carina . . . . . ***Armases,*** new genus

Key to the Western Atlantic Species of *Sesarma*

1. A distinct ridge posterior to outer orbital angle; walking legs broad, length distinctly less than twice width . . . . . ***rectum***
   A tooth posterior to outer orbital angle; walking legs with length greater than twice width 2
2. Anterolateral tooth weak, lacking a sinus cut into lateral margin of carapace . . . . . ***reticulatum***
   Anterolateral tooth strong, with sinus cut into lateral margin of carapace 3
3. Carapace with regions weakly defined, lacking granules, almost smooth, often with a fine pubescence . . . . . ***curacaoense***
   Carapace with regions defined, at least some granules present, pubescence (if present) confined to distinct small patches 4
4. Merus of walking legs with length about twice width . . . . . ***crassipes***
   Merus of walking legs with length about 3 times width (endemic to Jamaica) . . 5
5. Eyes greatly reduced . . . . . ***verleyi***
   Eyes normal 6
6. Third walking leg long, about 3 times carapace length; merus length about 4 times width . . . . . ***cookei***
   Third walking leg about 2.5 times carapace length; merus length about 3 times width 7
7. Dorsal margin of palm with a sharp continuous ridge; propodi and dactyli of walking legs without thick pubescence . . . . . ***jarvisi***
   Dorsal margin of palm with an irregular, broken ridge; propodi and dactyli of walking legs with thick pubescence . . . . . ***bidentatum***

Key to the Western Atlantic Species of *Armases*, new genus

1. Movable finger of male chela greatly expanded basally; distal three segments of walking legs with numerous, long, dark setae . . . . . ***benedicti***
   Movable finger of male chela not expanded; distal three segments of walking legs with few, short setae 2
2. Frontal region with lateral margins subparallel 3
   Frontal region widening distally 4
3. Front with very shallow median emargination in dorsal view; denuded gonopod terminating in very small, narrow endpiece . . . . . ***americanum***
   Front with deep emargination in dorsal view; denuded gonopod terminating in broad, V-shaped endpiece . . . . . ***roberti***
4. Endpiece of gonopod small, central, not armed . . . . . ***ricordi***
   Endpiece of gonopod subrectangular, directed distolaterally 5
5. Dactylus of fourth walking leg unarmed dorsally . . . . . ***miersii***
   Dactylus of fourth walking leg armed with short, black spines 6
6. Merus of fourth walking leg with length about 3 times width; gonopod blending smoothly into endpiece . . . . . ***angustipes***
   Merus of fourth walking leg with length about 2.6 times width; gonopod with small convex portion proximal to endpiece . . . . . ***cinereum***

Key to the Eastern Pacific Species of *Sesarma*

1. No anterolateral tooth posterior to outer orbital angle . . . . . ***rubinofforum***
   A distinct anterolateral tooth present posterior to outer orbital angle 2
2. Granules absent on dorsal surface of carapace; male gonopod slender; adult size about 13 mm cb . . . . . ***rhizophorae***
   Granules present on dorsal surface of carapace; male gonopod robust; adult size greater than 15 mm cb 3
3. Frontal region distinctly concave, joining midline at about 45° angle; female

gonopore with oblong-shaped operculum; adult size about 28 mm cb . . . . . ***sulcatum***

Frontal region weakly concave, joining midline at about 70° angle; female gonopore with barbell-shaped operculum; adult size about 16 mm cb . . . . . ***aequatoriale***

Key to the Eastern Pacific Species of *Armases*, new genus

1. Carapace length at midline greater than width . . . . . ***angustum***
   Carapace length at midline equal to or less than width 2
2. Carapace width about equal to length (cl/cb about 0.95); merus of fourth pereiopod with length about 2.5 to 3.0 times width . . . . . ***occidentale***
   Carapace width distinctly greater than length (cl/cb about 0.83); merus of fourth pereiopod with length about 2.0 to 2.5 times width 3
3. Extensor margin of dactylus of fifth pereiopods armed with black spines; palm smooth . . . . . ***magdalenense***
   Extensor margin of dactylus of fifth pereiopods unarmed; palm granulate . . ***gorei***

TABLE 1.—A List of the nominal species of *Sesarma* and *Armases*, new genus, reported from the Americas (* = type examined by the author).

Species	Status	Reference
*aequatoriale** Ortmann, 1894	valid	Abele, 1977b
africanum H. Milne Edwards, 1837	junior synonym of *huzardi*, erroneous report	Monod, 1956
americanum de Saussure, 1858	valid, senior synonym of *tampicense*	Chace and Hobbs, 1969
angustipes Dana, 1852	valid, senior synonym of *miersii iheringi*	Abele, 1972
*angustum** Smith, 1870	valid, senior synonym of *ophioderma*	Abele, 1977a
barbimanum Cano, 1889	junior synonym of *Nanosesarma minutum?*	Abele, 1979
benedicti Rathbun, 1897	valid	Holthuis, 1959
*bidentatum** Benedict, 1892	valid	Rathbun, 1918
*biolleyi** Rathbun, 1906	junior synonym of *occidentale*	Abele, 1977a
*bromeliarum** Rathbun, 1896	junior synonym of *roberti*	Rathbun, 1918
chiraga Ortmann, 1897	junior synonym of *benedicti*	Holthuis, 1959
cinereum Bosc, 1802	valid	Abele, 1973a
cookei Hartnoll, 1971	valid	Hartnoll, 1971
crassipes Cano, 1889	valid	Abele, 1979
curacaoense De Man, 1892	valid	Rathbun, 1918
*festae** Nobili, 1901	junior synonym of *occidentale*	Abele, 1977a
*gorei** Abele, 1981	valid	Abele, 1981
guerini H. Milne Edwards, 1853	junior synonym of *ricordi*	Rathbun, 1918
*hanseni** Rathbun, 1897	junior synonym of *dehaani*	Abele, 1975
*jarvisi** Rathbun, 1914	valid	Hartnoll, 1971
*magdalenense** Rathbun, 1918	valid	Rathbun, 1918
*miersii** Rathbun, 1897	valid	Abele, 1972
*miersii iheringi** Rathbun, 1918	junior synonym of *angustipes*	Abele, 1972
miniata de Saussure, 1858	junior synonym of *ricordi*	Rathbun, 1918
mulleri A. Milne Edwards, 1869	junior synonym of *rectum*	Rathbun, 1918
*occidentale** Smith, 1870	valid, senior synonym of *biolleyi* and *festae*	Abele, 1977a
*ophioderma** Nobili, 1901	junior synonym of *angustum*	Abele, 1977a
rectum Randall, 1840	valid, senior synonym of *mulleri*	Rathbun, 1918
reticulatum Say, 1817	valid	Rathbun, 1918
*rhizophorae** Rathbun, 1906	valid	Rathbun, 1918
ricordi H. Milne Edwards, 1853	valid	Rathbun, 1918
ricordi terrestris Verrill, 1908	junior synonym of *ricordi*	Rathbun, 1918
roberti H. Milne Edwards, 1853	valid	Abele, 1972
*rubinofforum** Abele, 1973b	valid	Abele, 1973b
stimpsonii Miers, 1881	junior synonym of *ricordi*	Abele, 1972
*subintegra** White, 1847	junior synonym of *rectum*	Abele, 1973b
*sulcatum** Smith, 1870	valid	Abele, 1977b
*tampicense** Rathbun, 1914	junior synonym of *americanum*	Chace and Hobbs, 1969
*verleyi** Rathbun, 1914	valid	Rathbun, 1918

Species of *Sesarma*

Sesarma reticulatum (Say, 1817)

FIGURES 1, 2*d-f*, 3*c*, 4*a*, 5*a*

Ocypode reticulatus Say, 1817:73, pl. 4: fig. 6.
Ocypode (Sesarma) reticulatus.—Say, 1818:442.
Sesarma cinerea.—DeKay, 1844:15.—White, 1847:38.
Sesarma reticulata.—Gibbes, 1850:180.—Stimpson, 1862:66.—Smith, 1870:156.—Ortmann, 1897:333.—Hay and Shore, 1918:448, pl. 36: fig. 12.
Sesarma (Sesarma) reticulata.—Rathbun, 1897a:89.
Sesarma (Sesarma) reticulatum.—Rathbun, 1918:290, pl. 77.—Williams, 1965:221, fig. 205.—1984:466, fig. 374.—Abele, 1973a:380, fig. 1D, E.
Sesarma reticulatum.—Humes, 1941:379.—Gray, 1957:34.—Teal, 1959:1.—Crichton, 1960:3.—Costlow and Bookhout, 1962:281.—Seiple, 1979:77.—Felgenhauer and Abele, 1983:187.—Abele and Kim, 1986:63, 673b.

MATERIAL EXAMINED.—Massachusetts: Woods Hole, 4♂, 2 ovigerous ♀, 10 Jul 1910, V.N. Edwards, USNM 45530; 1♂, USNM 32482; Wareham, 4♂, 1♀, 21 Jul 1887, USNM 12782; Acushnet River (New Bedford), 2♂, USNM 5784.

North Carolina: Near Beaufort, 10♂, 10♀, 1971, L.G. Abele.

Florida: Ft. Pierce, Pepper State Park, 2♀, 5 Nov 1977, L.G. Abele, R.H. Gore; Indian River, Sebastian Inlet Park, 13♂, 13♀ (1 ovigerous), 30 Jun 1977, L.G. Abele, R.H. Gore, K. Wilson, K. Rodman; Daytona Beach, 2♂, 6 Nov 1977, L.G. Abele, K. Heck; Sarasota Bay, 2♀, USNM 71169; Travertine Quarry, 3♂, 1♀, USNM 71302; Alligator Harbor (Franklin Co.), 1 ovigerous ♀.

DESCRIPTION.—Carapace broader than long cl/cb = 0.807±0.02 for males, 0.810±0.02 for females; dorsal surface punctate, regions well defined; lateral striae present. Outer orbital angle acute, margin slightly convex; low, weak tooth proximal to outer orbital angle; lateral margins converging toward midline. Interorbital region subdivided into four low lobes; iw/cb = 0.583±0.02 in males, 0.592±0.01 in females. Frontal region with lateral margins widening distally; anterior margin concave medially.

Eyes well developed, pigmented.

Chelipeds sexually dimorphic; female cheliped relatively smaller, not swollen, with fewer tubercles. Merus with posteromedial margin almost smooth forming arch at subdistal notch; anteromedial margin expanded distally with a few scattered low tubercles. Carpus granular, distinct medial border present slightly flared at anteromedial angle; tuft of setae in proximal medial portion and another at medioventral angle. Palm swollen, smoothly punctate on lateral surface, distinct row of granules dorsally and scattered large tubercles on medial surface; movable finger strongly arched with single proximal and single distal teeth; dorsal surface with about four to six tubercles. Immovable finger with row of three low and one large proximal teeth followed by concave region ending at small distal tooth; finger tips spooned, corneous; immovable one notched.

Walking legs relatively broad; ml/mw of third (fourth pereiopod) 2.05±0.24 in males, 2.16±0.17 in females; dorsal surface of carpus and dorsal and ventral surface of propodus and dactylus with a short, thick pubescence; propodus longer than dactylus.

Male abdomen subtriangular in outline; telson width subequal to length. Gonopod with subrectangular endpiece, curved laterally in distal region.

Female abdomen subcircular in outline; telson width slightly greater than length. Gonopore tear-shaped, level with sternum, widening away from suture; operculum raised above sternum increasing in height at wide end.

COLOR.—From various authors; Williams (1965:221):

Carapace dark olive, nearly black or purple; dark plum colored or bluish-black speckles crowded on grayish background, grayish color showing little except on posterior part; upper part of chelipeds similarly colored but brighter, greater part of palm yellowish, tips of fingers white or yellowish; upper part of legs as carapace; under parts grayish.

MEASUREMENTS.—Males cb 7.1 to 27 mm; females cb 10.7 to 18.2 mm; ovigerous females cb 17.9 to 22.2 mm.

TYPE LOCALITY.—East coast of the United States.

TYPE.—Not extant.

DISTRIBUTION.—Woods Hole, Massachusetts, to at least Indian River County on the east coast of Florida; Sarasota County on the west coast of Florida to Texas. The species is apparently absent from the tip of peninsular Florida (Abele, 1973a).

HABITAT.—*Sesarma reticulatum* is common in burrows in low areas of *Spartina* marshes. Crichton (1960) gives notes on the habitat of *S. reticulatum* in Delaware. Seiple (1979) found *S. reticulatum* to prefer silty substrates of low salinity (16.2‰) in the eulittoral region of *Spartina* marshes. They occur in burrows in red mangrove swamps in the southern part of their range.

REMARKS.—Seiple (1979) studied this species in the vicinity of Beaufort, North Carolina. Ovigerous females occur from April through August. Crichton (1960) reported from 8 to 10,000 eggs per female. I examined 11 females (cb 17.9-22.2) and found from 1894 to 5723 eggs per female. Larval development has been described by Costlow and Bookhout (1962).

The harpacticoid copepod *Cancrincola plumipes* Humes, 1941, is common in the gill chambers of *S. reticulatum*.

As noted in the "Introduction," at least two taxonomic problems with this species require further study. First, Dr. Darryl L. Felder (University of Southwestern Louisiana, pers. comm.) has pointed out that two color forms of this species occur in the Gulf of Mexico, and each form probably represents a distinct species. The second problem is that populations of this species on the southeast coast of Florida include individuals that appear morphologically to be very similar to *S. curacaoense*. For example, among the 26 individuals of *S. reticulatum?* from Sebastian Inlet Park are small individuals that could be identified as *S. curacaoense*, whereas large individuals appear to be *S. reticulatum*. It is possible that both species actually are represented in this population, as the locality is approxiately the southern end of the range for *S.*

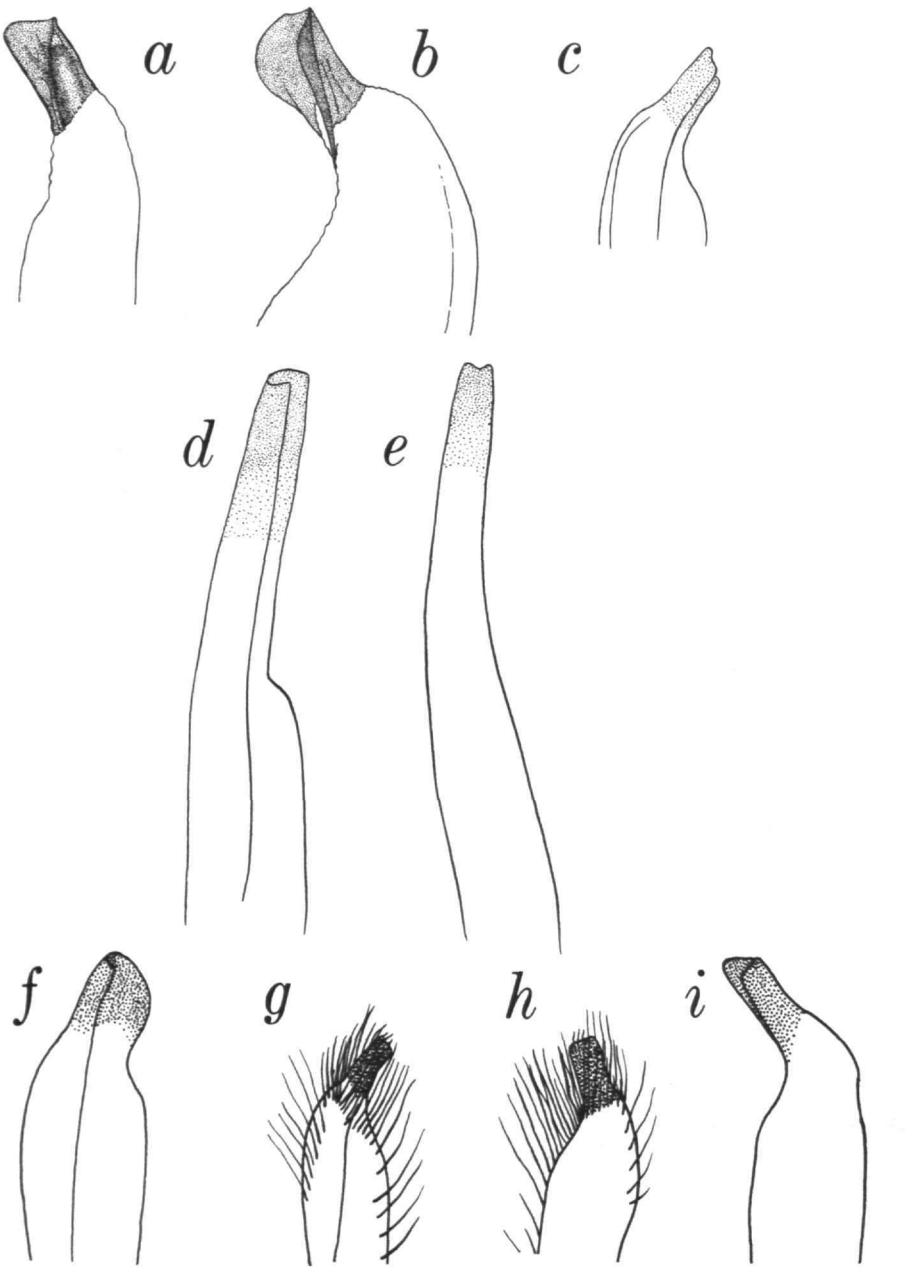

FIGURE 3.—Gonopods: *a*, *Sesarma curacaoense* (from Chace and Hobbs, 1969, fig. 62*p*); *b*, *S. rectum* (from Chace and Hobbs, 1969, fig. 62*j*); *c*, *S. reticulatum* (from Abele, 1973a, fig. 1); *d,e*, *S. rhizophorae*, Panama; *f–i*, *S. rubinofforum* (from Abele, 1973b, fig. 3).

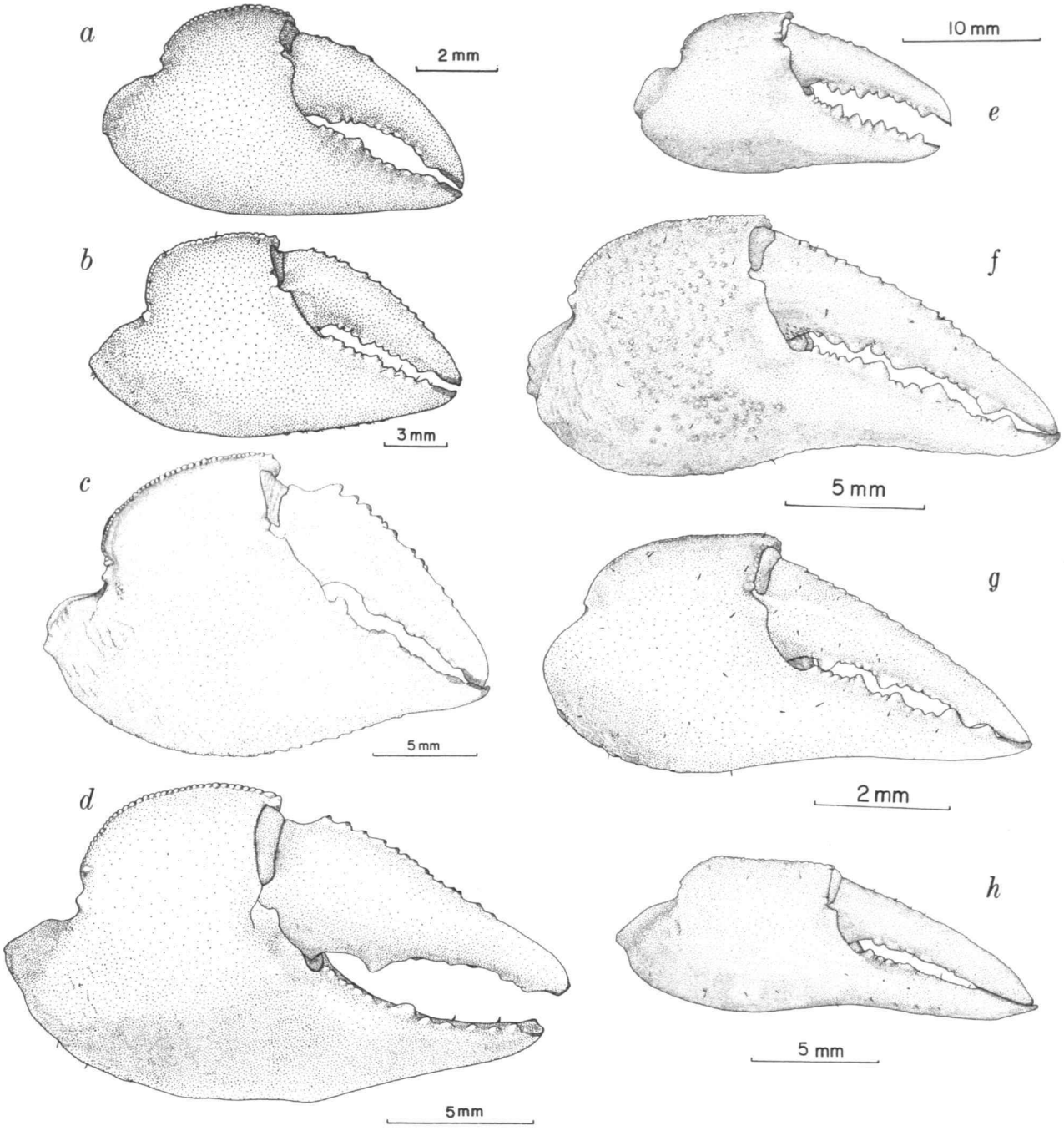

FIGURE 4.—Chelae: *a, Sesarma reticulatum; b, S. rectum; c, S. crassipes; d, S. aequatoriale; e, S. bidentatum; f, S. cookei; g, S. jarvisi; h, S. verleyi.*

reticulatum and the northern end of that for *S. curacaoense*. However, individuals appear to overlap morphologically, suggesting that additional study is needed.

Sesarma crassipes Cano, 1889

FIGURES 4*c*, 5*b*, 6, 7

Sesarma crassipes Cano, 1889:93.
Ses[arma]. crassipes.—De Man, 1892a:261.
Sesarma crassipes.—Rathbun, 1897a:90.
Sesarma (Sesarma s.s.) crassipes.—Tesch, 1917:142.
Sesarma (Sesarma) crassipes.—Rathbun, 1918:294.—Coelho and Ramos, 1972:204.
Sesarma crassipes Abele, 1979:178, figs. 1, 2.
?Sesarma crassipes.—Coelho and Ramos-Porto, 1981:178, fig. 1 [= *?S. curacaoense*].

MATERIAL EXAMINED.—Costa Rica: Tortuquero, about two miles [3.2 km] above the mouth of the Tortuquero River at Leós, 1♂, USNM 113280; Tortuquero, about two miles [3.2 km] above mouth of Tortuquero River, 1♀ (ovigerous), 1984, J. Rudloe.

DESCRIPTION.—Carapace broader than long (cl/cb = 0.89), indistinct granules, each with a small amount of pubescence, present on anterior and lateral regions of the carapace; sparse medially and posteriorly. Lateral margins widening slightly posteriorly. Interorbital region subdivided into four distinct lobes; median sinus deeper than submedial pair. Frontal region about 0.56 of carapace breadth; concave medially, oblique with a very small concave region to lateral margins, which flare very slightly. Distinct groove from lateral margin of frontal region extending posteriorly on the dorsal surface of carapace to about level of lateral tooth. Posterior orbital margin thickened, slightly sinuous, extending anteriorly forming a large acute, outer orbital angle. Distinct lateral tooth present on a higher level than outer orbital angle. About nine oblique granular ridges on lateral surface of carapace.

Eyes well developed, pigmented.

Basal antennular segment wide, short; palp slightly longer than width of basal segment. Basal antennal segment expanded laterally forming part of medioventral portion of orbit; ventrally forming part of Verwey's groove. Subtriangular area on pterygostomial region delimited dorsally by Verwey's groove. Suborbital region covered by short hairs.

Third maxillipeds gaping, exposing inner mouth parts; long setae present along medial edge; oblique row of pubescence on merus.

Male chelipeds strong, robust; in single specimen right slightly larger than left. Posterior mesial border of merus weakly toothed, ending in a distinct notch proximal to distal margin. Anterior mesial border strongly toothed, expanded distally. Two rows of pubescence present on mesial surface. Lateral border of merus toothed, ends in a notch proximal to distal margin. Mesial border of carpus delimited by row of tubercles at an acute angle; below angle two large and about three small tubercles; lateral border rounded and entire surface covered by short rugae. Dorsal surface of palm marked by distinct row of tubercles, extending beyond distal margin; lateral surface of palm smooth to very weakly marked by short rows of tubercles; mesial surface has about 10 large tubercles and 15 to 20 smaller tubercles that extend to and weakly delimit ventral border of palm; 8 to 12 tubercles on dorsal surface of movable finger extending from proximal margin, ending proximal to corneous, spooned tip of finger; ventrally a large, subbasal tooth and two to three smaller distal ones. Immovable finger armed with large basal tooth, subequal one distally and two weaker teeth proximal to corneous, spoon-shaped tip. Walking legs increasing in length from first, fourth, second, and third. For third walking leg (fourth pereopod) merus about twice length of carpus; carpus shorter than propodus; dactylus slightly shorter than carpus. Merus length about twice width; transverse rows of granules and large subdistal tooth on dorsal margin. Walking legs with ventral and dorsal row of thick pubescence extending from dorsal distal portion of carpus to distal margin of propodus where it extends as three narrow rows to distal portion of dactylus; ventrally row begins on distal portion of propodus and continues as three narrow rows on dactylus. Ventral surface of propodus armed with about three to five pairs of irregularly spaced dark-colored spines; on each side of ventral distal margin about four to five dark-colored spines.

Male abdomen subtriangular in outline; length and width of telson subequal. Endpiece of male gonopod short and subrectangular; shallow sinus on distolateral margin.

MEASUREMENTS.—The single available male is sexually mature and has a cb of 25.5 mm and cl of 22.2 mm. Cano (1889) stated that the male holotype has a cb of 22 mm and a cl of 18 mm. An ovigerous female has a cb of 23 and a cl of 20 mm.

TYPE.—The male holotype is presumed to be lost.

TYPE LOCALITY.—Pernambuco, Brazil.

DISTRIBUTION.—The species is known from near Tortuquero, Costa Rica, and Pernambuco, Brazil.

HABITAT.—The label accompanying the specimen from Costa Rica indicates that it was "dipnetted along shore" about two miles [3.2 km] above the mouth of the Tortuquero River at Leós (USNM 113280). Coelho and Ramos (1972) list the species from estuaries at Pernambuco. The female was found at almost exactly the same locality as the male. The surface salinity was 0‰, but the water at 3 m depth contained a marine fauna.

REMARKS.—Abele (1979) discussed the status of this species, which, based on information in the literature, appears to be rare. Coelho and Ramos-Porto (1981) listed this species from Brazil and illustrated a specimen they had identified as *S. crassipes*. Their illustration does not show *S. crassipes*. The general form suggests a juvenile *S. curacacaoense* but the absence of a dorsal tooth on the merus of the pereopods makes it questionable whether the specimen is even in the genus *Sesarma*.

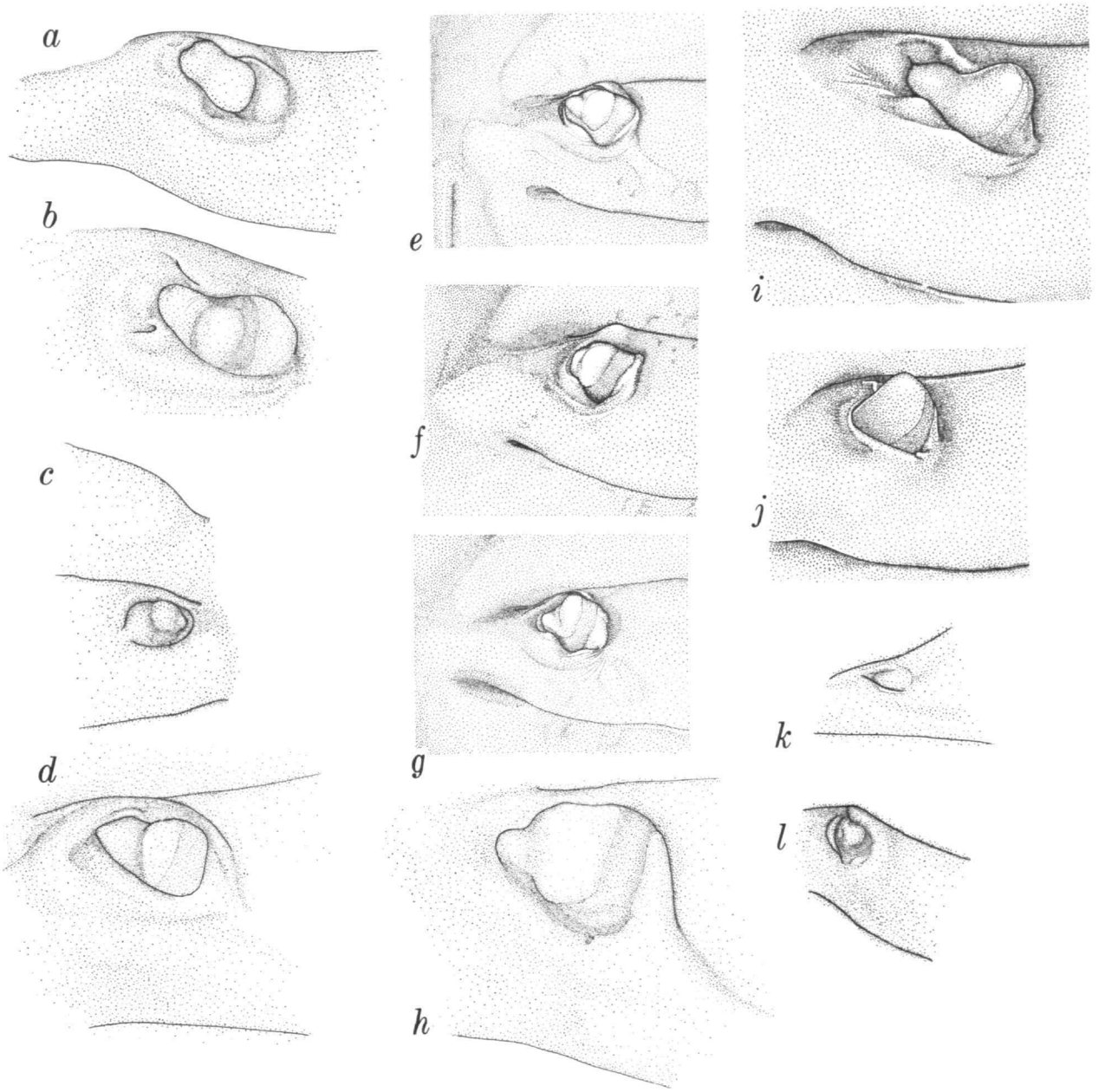

FIGURE 5.—Gonopores: *a, Sesarma reticulatum; b, S. crassipes; c, S. curacaoense; d, S. rectum; e, S. bidentatum; f, S. jarvisi; g, S. cookei; h, S. verleyi; i, S. aequatoriale; j, S. sulcatum; k, S. rhizophorae; l, S. rubinofforum.*

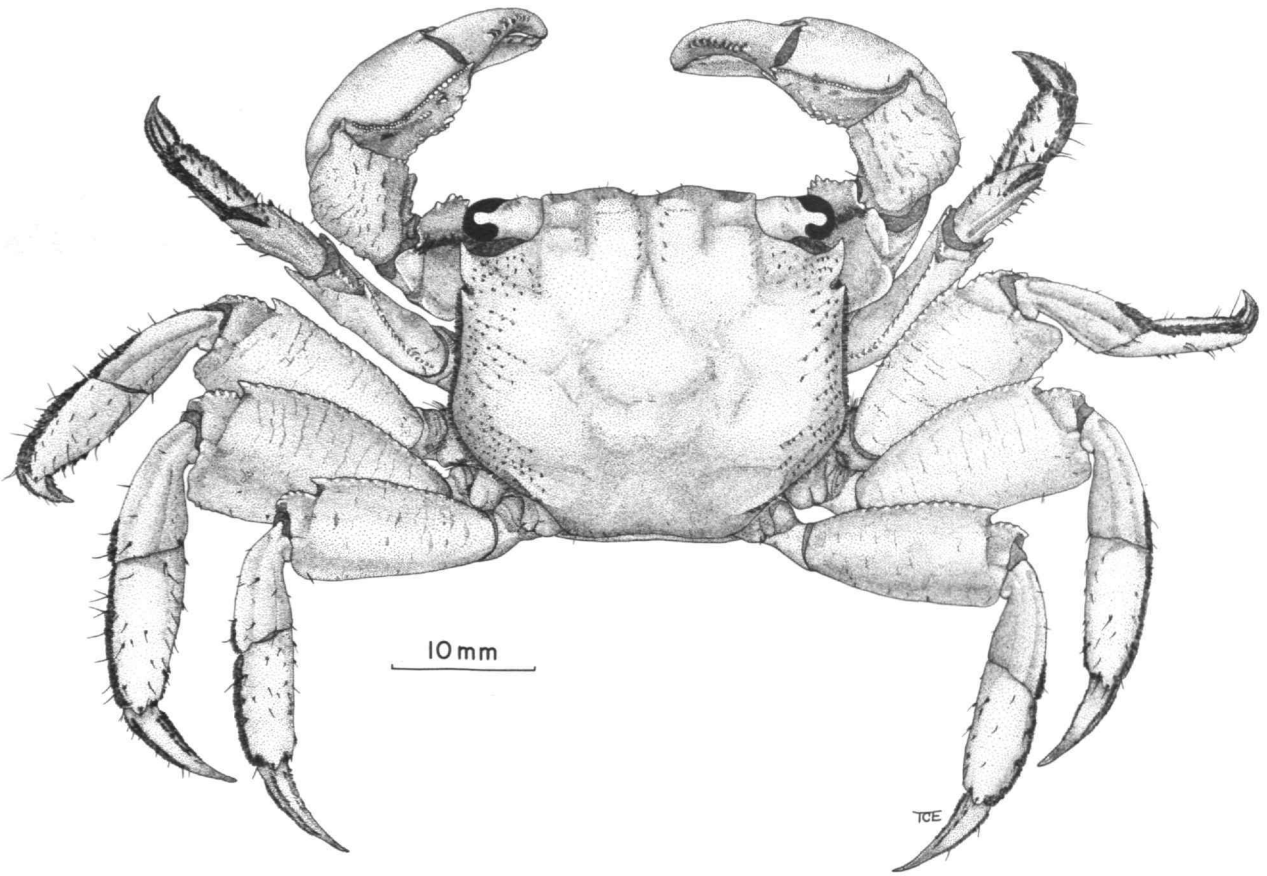

FIGURE 6.—*Sesarma crassipes*, male (USNM 113280).

Sesarma curacaoense De Man, 1892

FIGURES 3*a*, 5*c*, 8

Sesarma curacaoensis.—De Man, 1892a:257, pl. 10: fig. 6-6b.—Rathbun, 1897a:33.

Sesarma (Sesarma) curacaoensis.—Rathbun, 1897a:89.

Sesarma (Sesarma) curacaoense.—Rathbun, 1918:293, pl. 78: figs. 1, 2, pl. 160: fig. 3; 1933:90.—Holthuis, 1959:242, pl. XI: fig. 2.—Hartnoll, 1965:113, 139.—Chace and Hobbs, 1969:188, figs. 61, 62p.—Coelho and Ramos, 1972:203.—Abele, 1973a:380, figs. 1C, 1F.—Von Hagen, 1978:45, figs. 1b, 2b, 3b, 4b, 5b.

Sesarma (Sesarma s.s.) curacaoensis.—Rathbun, 1901:18.—Tesch, 1917:142.

Sesarma curacaoense.—Von Hagen, 1967:177.—Warner, 1969:381.—Abele, 1976:269.—Coelho and Ramos-Porto, 1981:178.—Rodriguez, 1980:382, fig. 105.—Abele and Kim, 1986:63, 673a.

?Sesarma crassipes.—Coelho and Ramos-Porto, 1981:178, fig. 1.

MATERIAL EXAMINED.—Florida: Jupiter, 5♂, 2♀, UMML; Coon Key, 3♂, 6♀, USNM 74850; Caximbas, Collier County, 2♂, 7♀, USNM 74859; Naples, 1♂, 1♀, UMML; Flamingo, 2♂, 3♀, USNM; Whitewater Bay, 3♂, UMML 32.1333, 32.13337; Miami, 2♂, 1♀, UMML; Key West, 1♂, USNM 74837.

Cuba: Cabanas, 1♂, 2 Jun 1900, W. Palmer, J.H. Riley, USNM 23814.

Puerto Rico: 1♂, *Fish Hawk* collections, USNM 24033.

Jamaica: 1♀, USNM 19419; Bogue Island, 1♂, C.B. Wilson, 20 Jun 1910, USNM 42890; Montego Bay, 1♂, 1♀, USNM 19422.

Curaçao: 3♂, 2♀, 2 juveniles, 10-14 Feb 1899, *Albatross* collections, USNM 17678.

Trinidad: Caroni Swamp, 3♂, 3♀, 2 ovigerous ♀, 1 juvenile, Oct 1971, J.M. Stanley, USNM 139298.

Panama: Galeta mangroves, 1 ovigerous ♀, 14 Jul 1969, L.G. Abele, USNM 139668.

Brazil: Mapelle, Bay of Bahia, 1 ovigerous ♀, R. Rathbun, USNM 40823.

DESCRIPTION.—Carapace broader than long (cl/cb = 0.824±0.36 in males, 0.811±0.11 in females), convex anterior to posterior; regions weakly defined with lateral striae. Fine pubescence often present dorsally. Anterolateral angle acute, followed posteriorly by deep sinus then distinct, acute anterolateral tooth set on higher level than anterolateral angle. Lateral margins of carapace converging posterior to anterolateral tooth. Interorbital region with four low lobes, iw/cb = 0.716±0.03 in males, 0.725±0.02 in females. Frontal

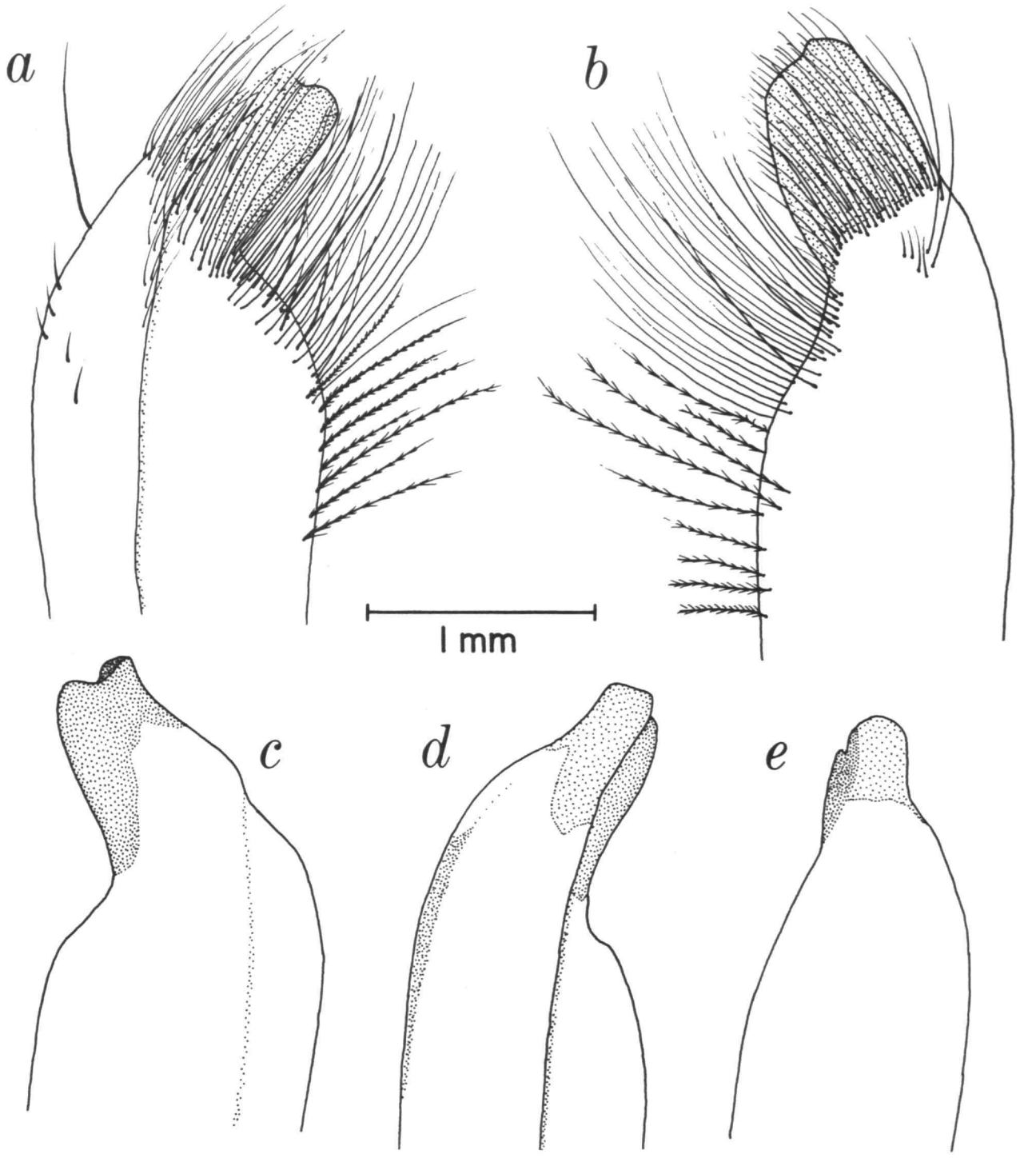

FIGURE 7.—*Sesarma crassipes*, gonopods (from Abele, 1979, fig. 3).

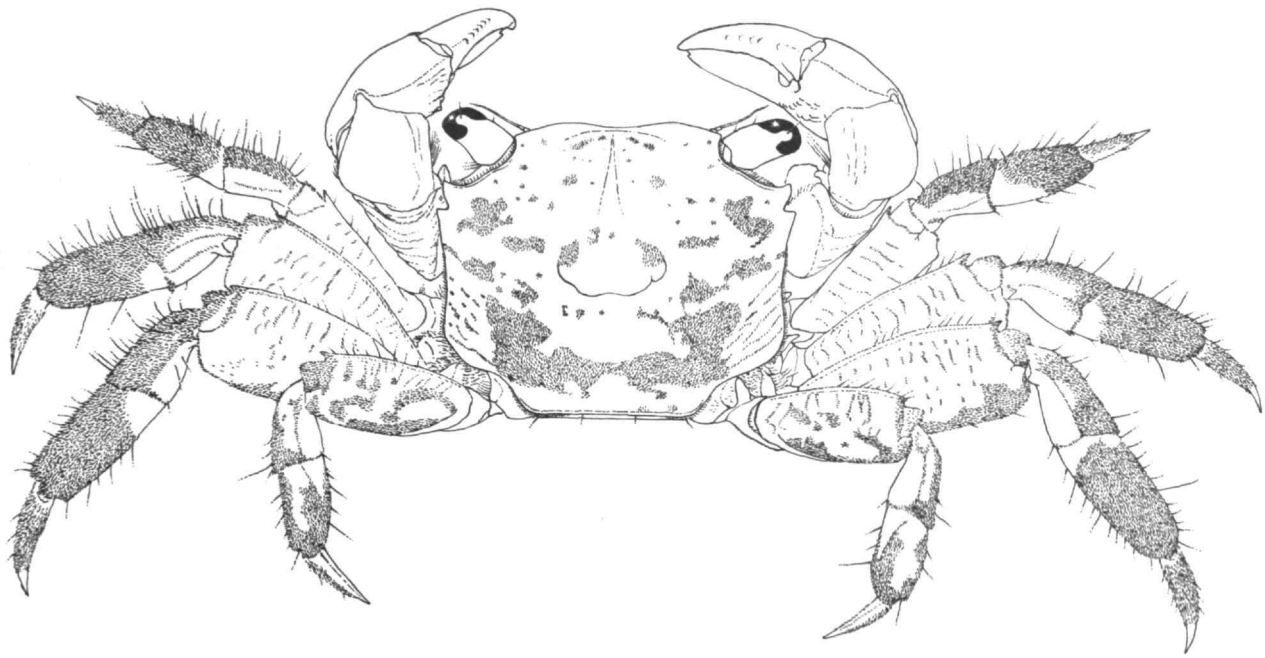

FIGURE 8.—*Sesarma curacaoense* (from Chace and Hobbs, 1969, fig. 61).

region slightly expanded at anterolateral margins; frontal margin arcuate in outline with median sinus.

Eyes well developed, pigmented.

Chelipeds sexually dimorphic, larger and more granular in males. Merus with medial posterior margin very weakly granulate, with subdistal notch, anterior margin with distinct tubercles; carpus unarmed; distinct rows of granules dorsally, narrow smoother area on mediointerior surface with tuft of setae proximally. Lateral surface of chela punctate, medial surface with a few tubercles; dorsal surface with distinct row of granules, indistinct row coming off proximally to distinct dorsal row. Movable finger with six to seven dorsal tubercles; three equally spaced distinct teeth. Immovable finger with basal tooth then concave area then another distinct tooth. Finger tips corneous and spooned.

Walking legs relatively slender, ml/mw of third about 1.99±0.47 in males, 2.19±0.11 in females; merus with distal, dorsal tooth. Fine pubescence present on carpus, propodus and dactylus, especially dense on dorsal surface.

Male abdomen subtriangular in outline; telson width at base subequal to length. Gonopod with subrectangular endpiece, relatively slender, bent laterally at base of endpiece.

Female abdomen subcircular in outline; telson width at base slightly greater than length. Gonopore recessed, oblong, roughly parallel to thoracic sutures; operculum raised especially laterally, similar in shape to gonopore.

MEASUREMENTS.—Males cb 13.5 to 17.9 mm, females cb 12.0 to 17.5 mm, ovigerous females cb 8.5 to 10.8 mm.

TYPE LOCALITY.—Curaçao.

TYPE.—The male holotype is deposited in the Nationaal Natuurhistorisch Museum, Leiden.

DISTRIBUTION.—Southern Florida to Estado da Bahia, Brazil. Coelho and Ramos-Porto (1981) list *S. crassipes* from several localities in Brazil and do not list *S. curacaoense*. However, their figure (fig. 1, p. 179) and ecological notes suggest that their material belongs to *S. curacaoense*.

HABITAT.—*Sesarma curacaoense* is common in mangrove swamps and among clumps of oysters and rocks on a mud substrate (Abele, 1973a). Warner (1969) found *S. curacaoense* to be most common in the landward portion of *Rhizophora* swamps and among *Avicennia* and *Laguncularia*.

REMARKS.—Abele (1973a) noted that secondary sexual characteristics appeared to develop over several molts. He noted that males achieved sexual maturity at about cb 11.0 mm and females at about the same size.

As mentioned under distribution, the status of this species and *S. crassipes* in Brazil requires examination. Coelho and Ramos (1972) listed both species from northern Brazil, but in 1981 they omitted *S. curacaoense*. Their figure, however, is suggestive of *S. curaceaoense* and is clearly not *S. crassipes* at least as currently recognized (see Abele, 1979).

Sesarma rectum Randall, 1840

FIGURES 3*b*, 4*b*, 5*d*, 9

Grapsus (Pachysoma) aff. *haematocheir*.—De Haan, 1835:62.
Sesarma recta Randall, 1840:123.—Kingsley 1880:217.—Ortmann, 1897:331, pl. 17: fig. 8.
Sesarma subintegra, n.s. White, 1847 [type locality, Brazil, nomen nudum, Abele, 1973b].
Sesarma mullerii A. Milne Edwards, 1869:29 [type locality Destero, Brazil].
Sesarma (Holometopus) recta.—Tesch, 1917:190.
Not *Sesarma mulleri*.—Miers, 1886:270, pl. 21: fig. 3 [= *Metasesarma rubripes* (Rathbun, 1897a)].
Not *Sesarma recta*.—De Man, 1892a:249, pl. 10: fig. 4 [= *Sesarma benedicti* Rathbun, 1897a].
Sesarma recta.—Rathbun, 1897a:90; 1900:137.
Sesarma (Holometopus) rectum.—Rathbun, 1918:298, pl. 82.—Holthuis, 1959:243, fig. 61, pl. 11: fig. 4.—Chace and Hobbs, 1969:182, fig. 62j.—Coelho and Ramos, 1972:203.
Sesarma rectum.—Coelho, 1966:244.—Fausto Filho, 1966:34.—Von Hagen, 1967:177.—Abele, 1973b:336.—Von Hagen, 1975:301, fig. 7.—Fimpel, 1975:1984.
Sesarma (Sesarma) rectum.—Von Hagen, 1978:45, figs. 1a, 2a, 3a, 4a, 5a.—Coelho and Ramos-Porto, 1981:178.

MATERIAL EXAMINED.—Trinidad: 1♂, 1♀, 30 Jan-2 Feb 1884, *Albatross* collections, USNM 19476; Caroni Swamp, mouth of Nariva River, 2♂, 1 ovigerous ♀, 22 May 1970, J.M. Stonley, USNM 13929.

Surinam: 1♀, 12 May 1957, L.B. Holthuis, *Coquette* collections (28), USNM 103276.

Brazil: Recife (Pernambuco), 1♂, 1876-77, R. Rathbun, USNM 40817; mangroves, 1♂, 1♀, 1 Aug 1899, Branner-Agassiz expedition, USNM 25711; Salvador (Bahia), Mapelle, 1♀, 1876-77, R. Rathbun, USNM 40819; Salt Lagoa, Caravellas, 1♀, 1876-77, R. Rathbun, USNM 40818; Paranqua, 1♂, 3 Oct 1925, W.L. Schmitt, USNM 71168; Rio de Janeiro, Terra de Masahe, 2♂, Jan 1912, E. Garbe, USNM 47862; Thayer expedition, 1♂, USNM 22839; Santos, Ilha Casquerinita, 1♂, 1♀, Jun 1913, H. Luederwaldt, USNM 47867; Pissaquera, 2♂, Jun 1913, H. Luederwaldt, USNM 47859; Iquape, 1♂, 1902, R. Krone, USNM 47827; São Francisco, 4♂, 1♀, 31 Oct 1925, W.L. Schmitt, USNM 71168.

DESCRIPTION.—Carapace slightly broader than long (cl/cb = 0.936±0.142 for males, 0.884±0.023 for females), moderately convex, with well-defined dorsal regions. Outer orbital angle acute; slight emargination present, indicated by ridge below angle with second stronger ridge below first. Lateral margins converging slightly posteriorly, striae present. Distinct depression posterior to orbital region; weak granules and tufts of pubescence present dorsally. Interorbital distance about 0.630 of carapace breadth (iw/cb = 0.630±0.01 in males, 0.613±0.02 in females), broad sinus medially.

Eyes well developed, pigmented.

Chelipeds distinctly sexually dimorphic. In males mediopos-

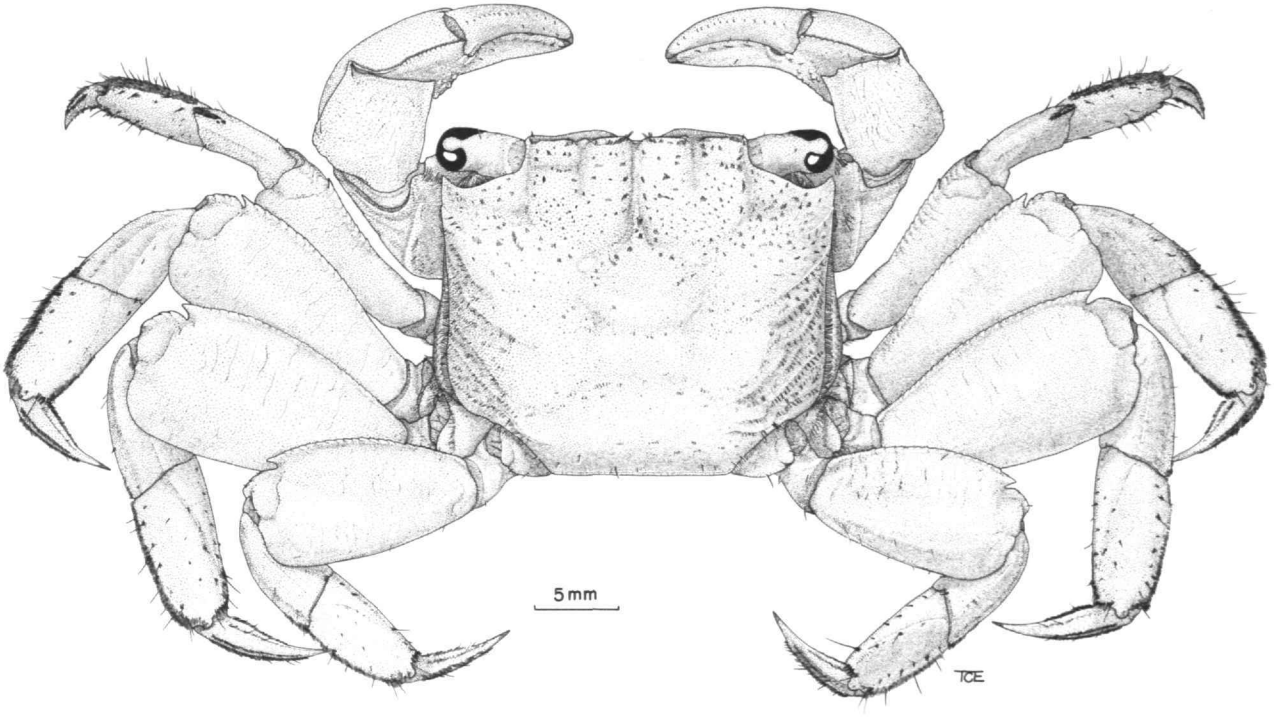

FIGURE 9.—*Sesarma rectum*, male, Trinidad.

terior margin of merus weakly granulate to subdistal notch, medioanterior region strongly toothed and expanded distally. Carpus granulate, armed with strong triangular tooth at medioanterior angle. Palm swollen, lateral margin almost smooth with low granules, medial margin with large tubercles present; dorsal surface with distinct tuberculate ridge extending beyond distal margin. Finger tips acute, weakly spooned; movable finger with about 14 to 16 dorsal tubercles along almost entire length. Female cheliped and that of immature males relatively smaller, with fewer and weaker tubercles.

Walking legs broad; ml/mw of fourth pereopod about 1.90±0.19 in males, 1.69±0.07 in females. Dactylus shorter than propodus and carpus; thick pubescence on dorsal surface of propodi and dactyli in both sexes; on ventral surface of dactyli in female and on ventral surface of propodi and dactyli in mature males.

Male abdomen subtriangular in outline; telson slightly longer than wide. Female abdomen subcircular in outline; telson broader than long.

Male gonopod simple, unarmed; endpiece unfolding, flared and directed laterally. Female gonopore set toward midline; oblong in shape with fold laterally; operculum raised above gonopore, high and expanded laterally narrowing and at a lower level medially.

MEASUREMENTS.—Mature males cb 16.8 to 30.4 mm, mature females cb 18 to 30 mm, ovigerous females cb 18 to 30 mm (Holthuis, 1959).

TYPE LOCALITY.—Surinam.

TYPE.—The male holotype is deposited in the Academy of Natural Sciences of Philadelphia.

DISTRIBUTION.—Trinidad, Tobago, Guyana, Surinam, Brazil south to Santa Catarina.

HABITAT.—*Sesarma rectum* is common in estuaries, where it digs burrows in the muddy banks (Holthuis, 1959; see von Hagen, 1975, fig. 7).

REMARKS.—The subgeneric status of this species was reviewed by von Hagen (1978), who showed that both *S. rectum* and *S. rubinofforum* belong to the *Sesarma* subgenus or species group. Von Hagen (1967, 1975) also provided information on the ecology of this species, including the mechanism and function of sound production.

Sesarma bidentatum Benedict, 1892

FIGURES 4*e*, 5*e*, 10, 11*s-x*

Sesarma bidentata Benedict, 1892:77.—Jarvis, 1897.—Rathbun, 1897c:33.
Sesarma-like.—Andrews, 1892:72.
Sesarma (*Sesarma* s.s.) *bidentata*.—Tesch, 1917:135.
Sesarma (Sesarma) bidentatum.—Rathbun, 1918:295, pl. 80.
Sesarma bidentatum.—Hartnoll, 1964b:159; 1965:113; 1971:260.—Abele and Means, 1977:91.—Guinot, 1988, 1988:8, fig. 1A.

MATERIAL EXAMINED.—Jamaica: St. Thomas Parish, stream adjacent to Bath Fountain Spa, elevation 135 m, 11♂, 10♀, 3 May 1976, L. Abele, B. Means; Portland Parish, 2.6 miles [4.2 km] W, SW of Ecclesdown on Project Road, Drivers River drainage, 650 m elevation, 12♂, 4♀, 1 ovigerous ♀, 5 May 1976, L. Abele, B. Means; Mabess River, N slope of Blue Mountains, 1♂, 21 July 1926, USNM 71170; same locality, 1932, W.G. Lynn, MCZ 12170; Mabess River above falls, 1♂, 2♀, 1932, W.G. Lynn, USNM 74849; Stony Valley River, 1♂, 20 Jun 1928, C.R. Orcutt, USNM 15539; tributary of Clyde River near Chester Vale House, 1♂, 1♀, 18 Jun 1936, W. Gardner Lynn, USNM 72772; Clyde River near Clydesdale, 1♂, 1♀, 28 Sep 1932, W.G. Lynn, USNM 74494; Clyde Spring, Blue Mountains, 5♂, 10♀, C.B. Wilson, USNM 42889; Clyde Spring near Cincliona, elevation 1300 m, 10 June 1910, USNM 41752; Clyde Spring, 1♂, 1♀, C.B. Wilson, MCZ 12169; St. Andrew Parish, near Kingston Harbor, 1♀ (holotype), T.H. Morgan, USNM 17281; Mountain Spring, 1♀, P.W. Jarvis, USNM 19053; Hardware Gap probably tributary of Buff Bay River, 1♀, 1 Jul 1932, W.R. Hatch, USNM 74825; St. Mary Parish, Lucky Hill Cooperative Farm, in stream inside cave, 400 m elevation, 3♂, 1♀, 6 May 1976, L. Abele, B. Means; Manchester Parish, Mandeville, 3♀, Henderson and Simpson, USNM 18573; St. Elizabeth Parish, Accompong, 1♂, P.W. Jarvis, USNM 19052; Trelawny Parish, small stream near Troy, elevation 1650 m, 4♂, 1♀, Nov 1905, W. Harris, USNM 32285.

DESCRIPTION.—Carapace broader than long (cl/cb = 0.834±0.023 in males, 0.882±0.057 in females), widening posteriorly. Outer orbital angle acute, lateral margin convex to strong anterolateral tooth. About nine transverse striae on lateral surface of carapace. Interorbital region subdivided into four lobes. Frontal region with margins subparallel, concave medially; iw/cb = 0.469±0.03 in males, 0.470±0.04 in females. Dorsal surface of carapace smooth; a few scattered setae on lateral surfaces.

Eyes well developed, pigmented.

Male chelipeds large, robust; merus with posteromedial margin granulate with a subdistal lobe, anteromedial margin with teeth, expanded subdistally; two rows of setae on medial surface. Carpus with granules becoming acute on anteromedial margin. Chelae swollen, granular with a few large acute granules on medial surface; dorsal surface with poorly defined row of granules ending in an acute granule; immovable finger with about seven large teeth; corneous tip asymmetrically bifid. Movable finger with about 10 to 12 small acute tubercles in poorly defined row; corneous tip acute. Female chelipeds similar though much less robust, lacking acute granules and carpus with tuft of setae on medioproximal angle.

Walking legs relatively long; ml/mw of third variable increasing to about 3.0 in large individuals. Dactyli with three dorsal and three ventral rows of pubescence; middle of ventral rows widest in males whereas ventral rows poorly defined in females. Propodus with dorsal pubescence, propodi of walking legs 1 and 2 with distinct ventral pubescence present on mature males, weak on large females; propodi of remaining legs with about five stout dark spines evenly spaced on inferior margin

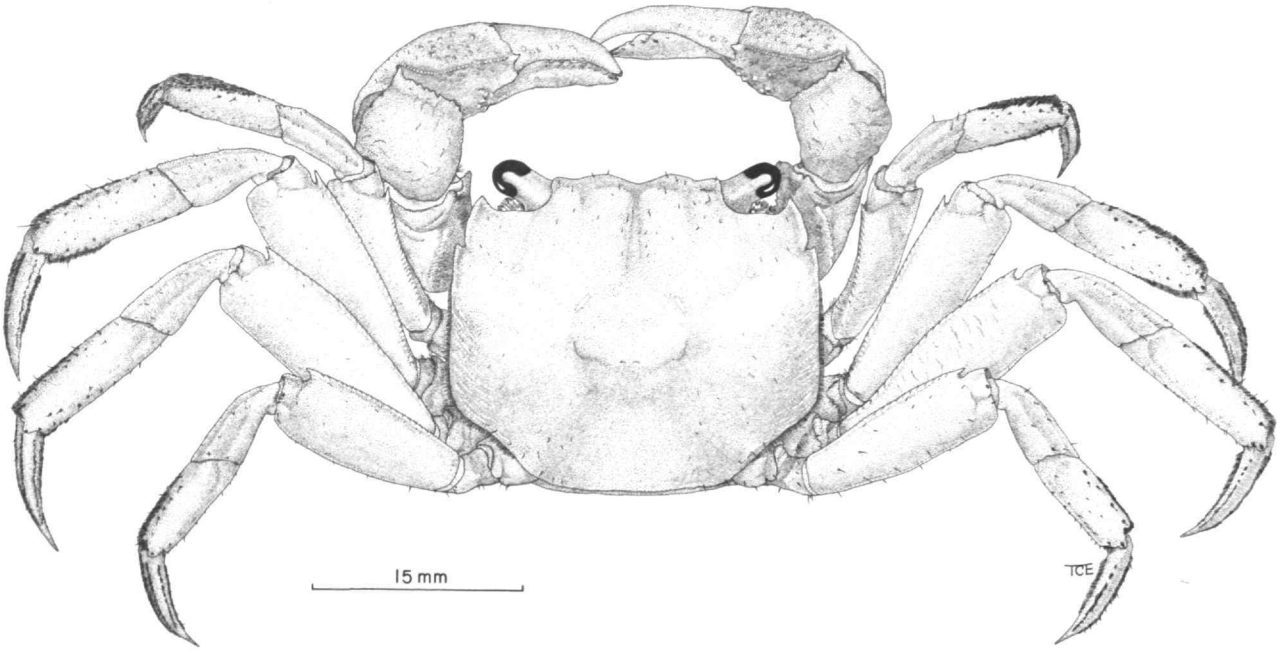

FIGURE 10.—*Sesarma bidentatum*, male, St. Thomas Paris, Jamaica.

and three to six on distal margin. Dactylus slightly shorter than propodus and longer than carpus.

Male abdomen subtriangular in outline; telson length and width subequal; distal margin lined with setae. Gonopod simple, unarmed distal region curved laterally at about 30° angle.

Female abdomen subcircular, telson length and width subequal. Female gonopore concave anterolaterally, notched posteriorly, narrowing and lengthening medially, operculum somewhat rectangular.

MEASUREMENTS.—Mature males cb 20.8 to 25.8 mm; mature females cb 20.5 to 23.7 mm, ovigerous females cb 20.5 to 23.2 mm. Males below cb 20 mm are immature, whereas females below cb 18.5 are immature (see Hartnoll, 1964b).

TYPE LOCALITY.—Kingston Harbour, Jamaica (Benedict, 1892). This is probably an error, as this species is freshwater and has never been collected near the harbor (Hartnoll, 1964b).

TYPE.—The female holotype is in the National Museum of Natural History, Smithsonian Institution (USNM 17281).

DISTRIBUTION.—This species is endemic to Jamaica and has been reported from the following localities (Hartnoll, 1964b): St. Thomas Parish (Bath Fountain, 130 m; Corn Puss Gap, 800 m); Portland Parish (John Crow mountains, 300 m; Clydesdale 1000 m; Section 1300 m; Clyde Spring, 1500 m); St. Andrew Parish (Mountain Spring, Yallahs River, Way Water Hermitage, 650 m); St. Mary Parish (Lucky Hill, 400 m); Manchester Parish (Mandeville); Trelawny Parish (Troy); St. Elizabeth Parish (Accompong). *Sesarma bidentatum* may not occur much above 1500 m, as I collected extensively on Blue Mountain in 1976 and was unable to find the species at higher altitudes.

HABITAT.—*Sesarma bidentatum* occurs in freshwater rivers, streams, and deep pools from about 100 (pers. obs.) to 1500 m elevation (Hartnoll, 1964b).

REMARKS.—Hartnoll (1964b) summarized what is known concerning the biology of this species including a description of the first zoea.

Sesarma jarvisi Rathbun, 1914

FIGURES 4*g*, 5*f*, 11*g–l*, 12

Sesarma (Sesarma) jarvisi Rathbun, 1914:124, pl. 7; 1918:286, pl. 81.
Sesarma (Sesarma s.s.*) jarvisi.*—Tesch, 1917:164.
Sesarma jarvisi.—Hartnoll, 1964b:145, 164 [part, specimens from John Crow = *S. cookei*]; 1965:113; 1971:258.—Abele and Means, 1977:91.—Guinot, 1988:5.
[*Sesarmoides*] *jarvisi.*—Serène and Soh, 1970:404.

MATERIAL EXAMINED.—Jamaica: St. Ann's Parish, Mount Diablo, 1♂ (holotype), P.W. Jarvis, USNM 24941; St. Ann's Parish, Mount Diablo, Hollymount (Henzell estate), 21♂, 20 ♀, 6 ovigerous ♀, 7 May 1976, L. Abele, B. Means, LGA 76-9; about four miles [6.4 km] below previous locality among rubble on side of road, 5♂, 1♀, 8 May 1976, L. Abele, B. Means, LGA 76-12; Manchester Parish, 3.75 miles [6.0 km] above Mile Gully, 9♂, 12♀, 10 May 1975, L. Abele, B. Means,

FIGURE 11.—Gonopods: *a–f, Sesarma cookei; g–l, S. jarvisi; m–r, S. verleyi; s–x, S. bidentatum.*

LGA 76-14.

DESCRIPTION.—Carapace broader than long (cl/cb = 0.932±0.04 in males, 0.905±0.03 in females), lateral margins subparallel. Outer orbital angle subacute, usually with small tuft of pubescence near apex; lateral margin straight to slightly convex to strong anterolateral tooth. Interorbital region subdivided into four lobes, median pair large, distinct, lateral pair shallow, poorly defined. Frontal region concave, lateral margins subparallel lacking distinct anterolateral angles, distinctly concave medially; iw/cb = 0.439±0.03 in males, 0.443±0.03 in females. Regions of dorsal carapace surface well defined; anterior portion with many small scattered tufts of pubescence.

Eyes well developed, pigmented.

Chelipeds not sexually dimorphic; merus with posteriomedial and anteriomedial margins granulate, former with subdistal

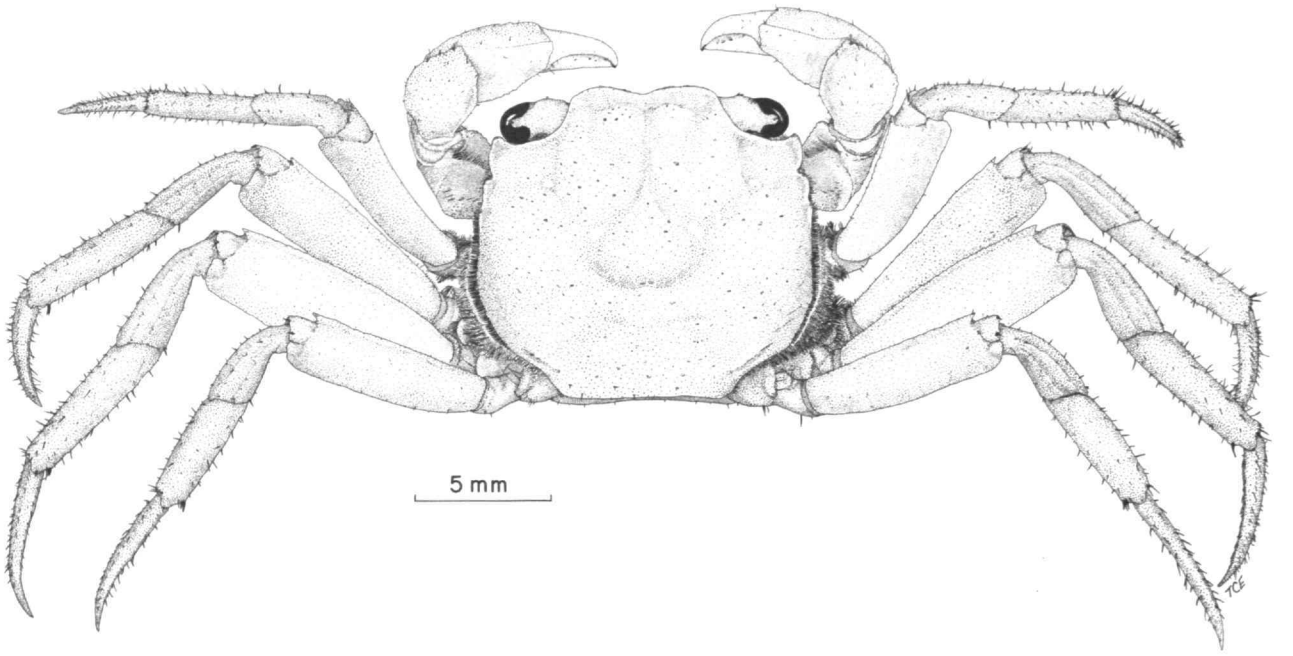

FIGURE 12.—*Sesarma jarvisi*, male, Holly Mount (Mount Diablo), Jamaica.

lobe; two rows of setae on medial surface, posterior row poorly developed. Carpus granulate, granules acute on anteriomedial margin; small tufts of setae dorsally. Chelae slightly swollen, covered with small granules, tending to be acute on larger specimens; dorsal margin with a distinct, continuous row of single granules; immovable finger with two proximal and two distal large teeth with smaller teeth between them; corneous tip acute, minutely and asymmetrically bifid. Movable finger with three large teeth, two proximal closer to each other than to distal tooth, smaller teeth between them; dorsal surface with 8 to 10 small acute tubercules; corneous tip acute.

Walking legs relatively long, slender; ml/mw = 3.01±0.22 in males, 3.30±0.48 in females. Dactylus and propodus with many, long, thick black setae present, a few dark spines on distal ventral margin of propodus. No fine pubescence on walking legs of either sex. Dactylus distinctly longer than propodus, which is longer than carpus.

Male abdomen subtrangular in outline; telson distinctly broader than long. Gonopod simple, unarmed, endpiece curved laterally with distinct subdistal constriction in caudal view.

Female abdomen subrectangular, relatively narrow, margins lined with setae, not extending beyond sternum; telson slightly broader than long. Gonopore oblong, slight concavity on posterior margin, narrowing medially; operculum raised well above sternum, oblong to subrectangular and narrowing medially. Eggs large (~1.32 mm) and few.

MEASUREMENTS.—Males cb 6.8 to 12.3 mm, females cb 6.8 to 12.4 mm, ovigerous females cb 10.2 to 12.4 mm. Both sexes appear to attain sexual maturity at about cb 10.0 mm.

TYPE LOCALITY.—Mount Diablo, St. Ann's Parish, Jamaica.

TYPE.—The holotype is a dry male, cb 12.0 mm, deposited in the National Museum of Natural History, Smithsonian Institution (USNM 24941).

DISTRIBUTION.—This Jamaican endemic has been reported from the following localities, all west of the Blue Mountains: St. Ann's Parish, Mount Diablo (Rathbun, 1914; Abele and Means, 1977); St. Elizabeth's Parish, Balaclava (Hartnoll, 1964b); Manchester Parish, Mile Gully (Abele and Means, 1977). The specimens from Portland tentatively referred to this species by Hartnoll (1964b) are, as he indicated in 1971, *Sesarma cookei*.

HABITAT.—*Sesarma jarvisi* is apparently restricted to limestone talus and rock rubble substrates on Jamaica west of the Blue Mountains between 300 and 900 m elevation. The crabs were common under limestone rocks in second growth forest. Two sites were talus slopes (one man-made along a road shoulder), three were old rock cairns piled up during coffee agriculture, and one was loose limestone rubble lying in the bed of a surface runoff gully. Leaf litter overlying the rocks was damp, but the underlying reddish clay substrate and the limestone rubble were dry. Juveniles, males, females, and ovigerous females were represented in this habitat.

REMARKS.—Ovigerous females were collected by Abele and Means (1977). Eggs early in development measured about 1 mm in diameter, reaching 1.32 mm immediately prior to hatching. Females carried 7 to 18 eggs, although some may

have been lost during handling. From each of seven eggs a large zoea emerged (measuring 3 mm total length and 1.36 mm across the yolk-filled carapace). The mouthparts are poorly developed, consisting of small lobes, suggesting that the zoea does not feed; all pereopods are present and larger than in the related *M. depressus*, a species with modified larval development (Hartnoll, 1964b). A search of the area where the females were collected failed to reveal any water, other than that in bromeliads, that could serve as a site for larval development. Abele and Means (1977) could have overlooked zoea in bromeliads but probably not females. Berried females from which zoea hatched were maintained in plastic bags with damp leaf litter and 5 to 10 ml of water in the bottom. Unfortunately, both females and larvae died within a few hours of hatching, before observations on development were possible.

Sesarma cookei Hartnoll, 1971

FIGURES *4f, 5g,* 11*a–f,* 13

Sesarma cookei Hartnoll, 1971:257, pl. 1.—Abele and Means, 1977:91.—Guinot, 1988:11.

MATERIAL EXAMINED.—Jamaica: Portland Parish, John Crow Mountains 2.5 miles [4 km] SW of Ecclesdown on Project Road, 6♂, 5♀, 4 May 1976, L. Abele, B. Means.

DESCRIPTION.—Carapace broader than long (cl/cb = 0.891±0.04 in males, 0.918±0.04 in females), widening posterirly. Outer orbital angle acute, lateral margin slightly convex to strong anterolateral tooth. Striae on lateral carapace surface weak. Interorbital region subdivided into four lobes; median sinuses strong, lateral sinuses weak. Frontal region with margins subparallel; concave medially, convex to anterolateral angles; iw/cb = 0.423±0.04 in males, 0.442±0.02 in females. Dorsal surface of carapace smooth, regions weakly defined with few scattered pubescent tufts.

Eyes relatively small, not filling orbital region.

Chelipeds of both sexes relatively long and narrow; merus with posteromedial margin granulate and subdistal lobe, anteromedial margin with teeth slightly expanded distally; two rows of comb setae on lateral surface, anterior row strong. Carpus granulate becoming acute on medial margin; anteromedial margin raised in males and expanding into a lobe distally in both sexes. Chelae granulate, no well-defined dorsal ridge on palm, granules large, acute on medial surface; male palm swollen compared to female. Fingers long, slender, about 1.6 times palm length; movable finger with about 9 to 12 acute granules dorsally, many fewer in females; about four large teeth present, two basal, one about midway, and one subdistal to corneous acute tip. Immovable finger with about three large teeth, about equidistant from corneous asymmetrical bifid tip.

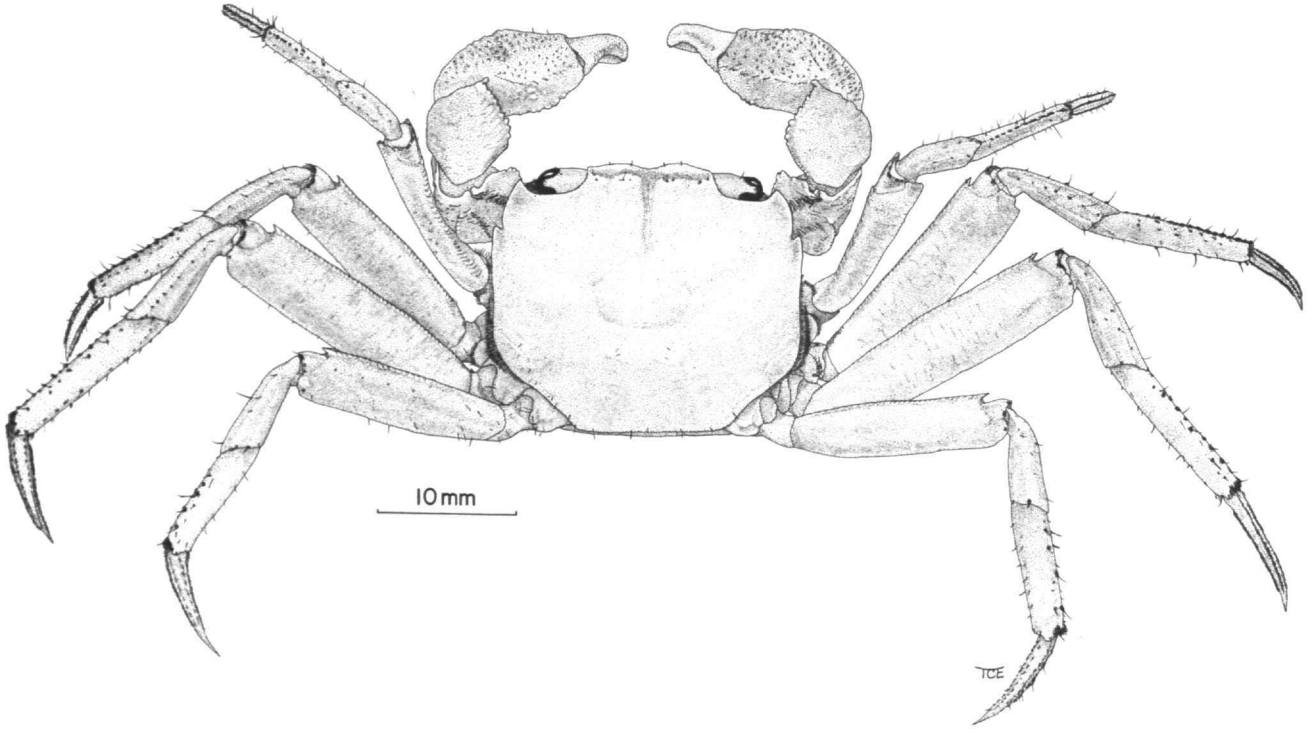

FIGURE 13.—*Sesarma cookei,* male, John Crow Mountains, Jamaica.

Walking legs long, slender; ml/mw of third 4.19±1.0 in males, 3.93±0.4 in females with ratio increasing with size in both sexes. Propodus of pereopods 2 and 3 with thick pubescence on distal half of ventral surface; scattered tufts on dorsal surface. Dactylus shorter than propodus with three dorsal and three ventral rows of pubescence.

Male abdomen subtriangular in outline; telson length and width subequal; distal margin lined with setae. Gonopod relatively short, simple, unarmed; distal region narrowing at amber-colored endpiece, slightly curved laterally.

Female abdomen subcircular in outline, not extending to coxae of pereopods, margins lined with setae; telson broader than long. Female gonopore almost subcircular with slight expansion toward pore posteromedially; operculum raised well above sternum, tilted toward midline, almost subrectangular in outline. Eggs large (1.25 mm diameter) and few.

HABITAT.—This species appears to terrestrial in habit. Individuals have been collected in dry limestone rubble and in a talus pile. The sites were shaded, but no standing water was in the collecting areas (Abele and Means, 1977).

REMARKS.—Abele and Means (1977) provide notes on the habitat and distribution of this species. They reported large eggs (diameter 1.25 mm) from the oviducts of a female and suggested that rapid larval development occurs in temporary pools of water formed by heavy rains.

MEASUREMENTS.—Males cb 8.5 to 17.4 mm, females cb 8.4 to 19.0 mm. Males above cb 9.4 mm and females larger than cb 9.9 mm appear to be sexually mature.

TYPE LOCALITY.—A few miles southwest of Ecclesdown in the John Crow Mountains, Portland Parish, Jamaica.

TYPE.—A mature female in the Natural History Museum, London, BM 1969:1085.

DISTRIBUTION.—*Sesarma cookei* is known only from the John Crow Mountains in eastern Jamaica from about 400 to 650 m elevation.

Sesarma verleyi Rathbun, 1914

FIGURES 4*h*, 5*h*, 11*m–r*, 14

Sesarma (Sesarma) verleyi Rathbun, 1914:123, pl. 6; 1918:288, pl. 76.—Hartnoll, 1965:113.—Chace and Hobbs, 1969:191.—Hobbs, Hobbs, and Daniel, 1977:146, figs. 69, 70.

Sesarma verleyi.—Hartnoll, 1964a:145, 164–166, 168, fig. 148; 1964b:78; 1965:113.—Chace and Hobbs, 1969:157.—Hartnoll, 1971:260–262.—Peck, 1975:308, 312, fig. 4.—Abele and Means, 1977:91.—Guinot, 1988:9, figs. 1B, 10, pl. 1, figs, 1, 2.

Sesarma.—Peck, 1974:34.

MATERIAL EXAMINED.—Jamaica: Saint Elizabeth Parish, Nudgrave (a small village in the cockpit country near Spanish (Ipswich), St. Elizabeth), 1♀ (holotype), Miss Verley, USNM 24920; St. Mary Parish, limestone cave at Lucky Hill, 1♂, 4♀, 6 May 1976, L. Abele, B. Means.

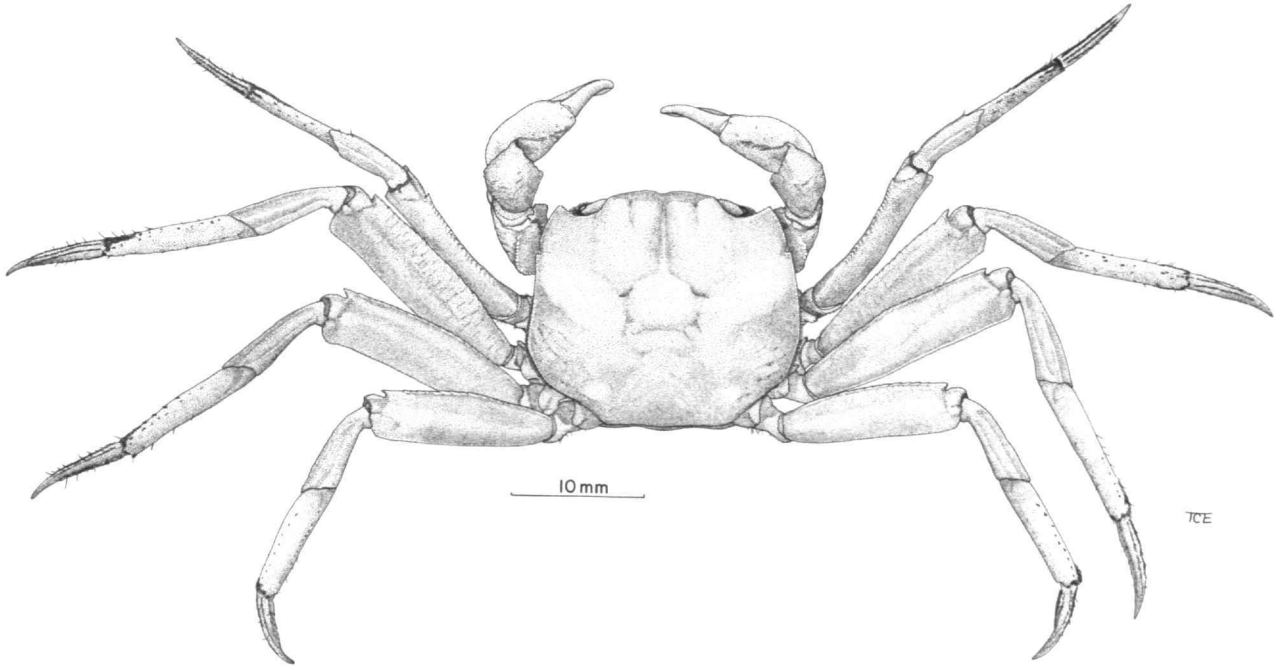

FIGURE 14.—*Sesarma verleyi*, male, Lucky Hill Cave, Jamaica.

DESCRIPTION.—Carapace broader than long (cl/cb = 0.89 in a male, 0.866±0.01 in females), distinctly wider posteriorly. Posterior orbital margin and acute outer orbital angle distinctly granular. Lateral margin oblique to blunt anterolateral tooth. Posterior portion of carapace strongly convex laterally. About nine weak striae laterally. Interorbital region subdivided into four low lobes. Frontal region with margins subparallel, no true lateral angles present; frontal margin concave medially; iw/cb = 0.475 in a male, 0.466±0.02 in females. Dorsal surface of carapace smooth, regions defined.

No obvious sexual dimorphism in chelipeds; long, slender in both sexes. Merus with posteromedial margin granulate with subdistal lobe, anteromedial margin with teeth; two rows of setae on medial surface, posterior one poorly defined. Carpus granulate, anteromedial margin produced into sharp angle. Chelae slender with a few striae dorsally on palm; movable finger slender without tubercles dorsally, armed with about five low teeth on cutting edge to corneous acute tip; immovable finger with about three low teeth on cutting edge to acute corneous tip.

Eyes greatly reduced.

Walking legs long, slender; ml/mw of third = 3.69±0.4 in males and females. Propodus of walking legs 1 and 2 with thick pubescence distally; dactylus with three ventral and three dorsal rows of pubescence. Distal inferior margin of propodus with zero to two stout black spines. Dactylus shorter than propodus, longer than carpus.

Male abdomen subtriangular in outline; telson length and width subequal. Gonopod simple, unarmed; endpiece with slight flare distally, turned laterally.

Female abdomen subcircular; telson slightly broader than long. Gonopore almost subcircular in outline but narrowing medially and with margin straight, not curved posteriorly; operculum oblique, set above sternum, subrectantular in outline with medial margin bilobed.

TYPE.—The dried female holotype (cb 21.9 mm) is extant in the National Museum of Natural History, Smithsonian Institution (USNM 24940).

DISTRIBUTION.—Endemic to Jamaican caves (Hartnoll, 1964a). Saint Elizabeth Parish, Mulgrave; Saint Mary Parish, Lucky Hill cave; Saint Catherine Parish, cave at Worthy Park, St. Claire Cave, Edwaston; Saint Ann Parish, Cricket Cave, Douglas Castle.

REMARKS.—Hartnoll (1964a, 1964b) presented notes on the biology of *S. verleyi*. He found that a male of cb 20.5 mm had partly mature gonads and that females attained sexual maturity between 18 and 21 mm. Although none of the females were ovigerous, examination of the ovaries revealed eggs greater than 1 mm in diameter. The ovaries of *S. verleyi* are little unusual in that they extend posteriorly and then join, in contrast to those of other grapsids, in which the arms do not join.

This species is very similar morphologically to *S. cookei*, a terrestrial species known only from the John Crow mountains of Jamaica. *Sesarma verleyi* can be distinguished from *S. cookei* most easily by the distinctly granular region of the posterior orbital margin and outer orbital angle of *S. verleyi*, which is smooth in *S. cookei*.

Sesarma aequatoriale Ortmann, 1894

FIGURES 4*d*, 5*i*, 15, 16, 17*b*,*d*

Sesarma aequatorialis Ortmann, 1894:722, pl. 23: figs. 14, 14k, 14z [type locality Ecuador].

Sesarma (Sesarma) aequatorialis.—Rathbun, 1897b:112.—Nobili, 1901:44.

Sesarma (Sesarma s.s.*) aequatorialis*.—Tesch, 1917:128.

Sesarma (Sesarma) aequatoriale.—Rathbun, 1918:292, fig. 146.

Sesarma (Sesarma) sulcatum.—Rathbun, 1918:289 [in part, see material examined].

Sesarma sulcatum.—Crane, 1947:86 [at least ovigerous female and juveniles from Golfito, male = *S. sulcatum*].—Abele, 1976:268 [in part, 1 male].

Sesarma aequatoriale.—Abele and Blum, 1977:246.—Abele, 1977b:495, figs. 1, 2, 5c,d; 1981:437.

MATERIAL EXAMINED.—Mexico: Guerrero, 3♂, 3♀, 4 Jan 1933, Velero, AHF 3-33; Acapulco, 1♀, Hassler Expedition, MCZ 6244.

Costa Rica: Boca de Jesus, 1♂, Apr 1905, Biolley and Tristan, USNM 32315; Golfito, 1 ovigerous ♀, 3 juveniles, 6-7 Mar 1938, Zaca, AMNH 13508.

Panama: El Real, 18♂, 11♀, 1 ovigerous ♀, 26 Oct 1966, R. Rish, USNM 125916 (4♂, 1♀), AHF 1967-88 (remaining specimens); Chucunaque River, 1♀, 26 Nov 1965, D. Quintero, USNM 119853; La Capitana (Canal Zone), 1♂, H. Pittier, USNM 45532; San Jose Island, Pearl Islands, river at Playa Grande, 1 ovigerous ♀, 20 May 1973, L. Abele, R. Dressler; Rey Island, Pearl Islands, 1♂, 3♀, coll., 19 May 1973, L. Abele, R. Dressler; Diablo mangrove swamp; 1♂, 18 Feb 1969, L. Abele; Albrook Air Force Base mangrove swamp; 2♂, 2♀, 6 May 1969, L. Abele; same locality, 1♂, 18 Jun 1974, L. Abele.

Ecuador: 2♂, 1♀ (syntypes), 1874, Reiss, MZ; Esmeraldas, 1♀, E. Festa, MIZS Cr. 114.

DESCRIPTION.—Carapace wider than long with low but distinct granules dorsally along with scattered tufts of pubescence (cl/cb ratio 0.834±0.02 for females). Ratio varies with size, about 0.78 in small males and 0.86 in large males; 0.83 in small females and 0.85 in large females. Lateral margins subparallel although posterior carapace may widen slightly in small specimens and narrow slightly in large males. Interorbital region subdivided into four low lobes; median sinus deeper than submedial pair. Frontal region concave medially; oblique laterally to lateral margins that flare slightly so that frontal region widens distally (iw/cb ratio is 0.597±0.02 in males and 0.588±0.02 in females). Outer orbital angle extended anteriorly and acute; distinct lateral tooth present posterior to outer orbital angle. Both outer orbital angle and lateral tooth variable in size, often larger and more acute than in syntype figured. About seven granular ridges on lateral surface of carapace.

Eyes well developed, pigmented.

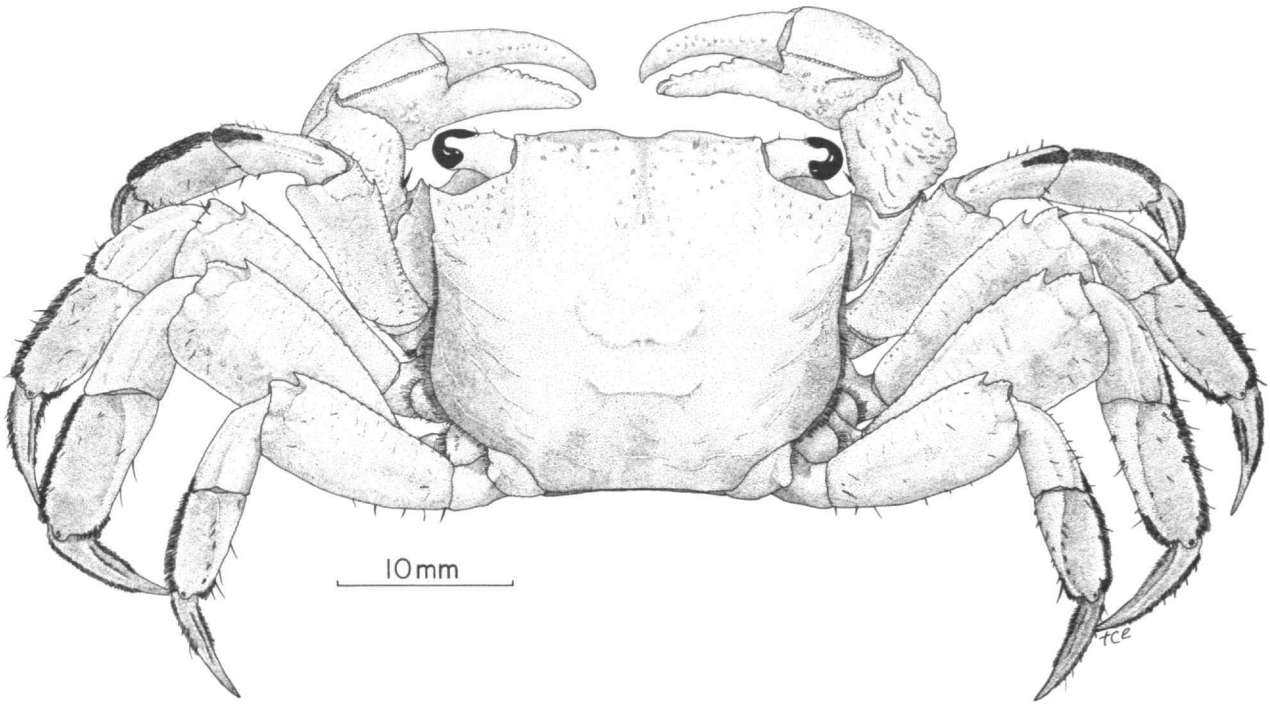

FIGURE 15.—*Sesarma aequatoriale*, syntype male (from Abele, 1977b, fig. 1).

Chelipeds sexually dimorphic, male chelipeds large, robust. Posterior mesial and lateral borders of merus weakly serrated; serrations of latter end proximal to distal margin, anterior mesial margin toothed. Carpus covered with short rows of granules. A distinct row of large granules along dorsal margin of palm; lateral surface smooth to punctate while mesial surface with about 10 large tubercles arranged in poorly defined dorsoventral row. Immovable finger narrows distally to corneous, spooned apex; about 7 to 13 unequal teeth present. Movable finger with row of 10 to 14 acute tubercles along dorsal margin; a large basal tooth and about eight smaller teeth proximal to a larger tooth present proximal to tip. Female chelipeds considerably smaller than those of equal-sized mature males. Palm lacks tubercles on mesial surface and movable finger has only five or six weak tubercles on dorsal margin.

Walking legs increase in length in order: first, fourth, second, and third. For third walking leg (fourth pereiopod) merus about 1.6 times length of carpus; carpus slightly shorter than propodus; dactylus about $^5/_6$ times length of propodus. Merus length about twice width (ml/mw = 2.19±0.13 in males, 2.06±0.12 in females); transverse rows of granules present and a large subdistal tooth on dorsal margin. Merus of fourth walking leg (fifth pereiopod) broader than that of third (ml/mw = 2.03±0.10). Walking legs with a ventral and dorsal row of thick pubescence extending from dorsal distal part of carpus to distal margin of propodus; it continues as three narrow rows on dorsal surface of dactylus; ventrally row begins on distal part of propodus and continues as three narrow rows on dactylus. Ventral surface of propodus armed with about five closely set pairs of spines in three indistinct rows, about six dark-colored spines on each side of ventral distal margin.

Male abdomen subtriangular in outline; length and width of telson subequal. Endpiece of male gonopod relatively long; sinus on distolateral margin. Form of sinus somewhat variable, may consists of only a concavity. In almost all (80%) specimens examined endpiece damaged to some extent along sinus margin.

Female abdomen semicircular in outline. Female gonopore and operculum figured (Figure 17).

MEASUREMENTS.—Males, cb 9.7 to 24.1 mm; females, cb 10.5 to 24.3 mm; ovigerous females cb 16.4 to 21.0 mm; males larger than about cb 19.0 appear to be sexually mature, whereas females appear to attain sexual maturity at about cb 16.0 mm.

TYPE LOCALITY.—Ecuador.

TYPE.—The syntypes (two males, two females) are extant in the Museo ed Istituto di Zoologica Sistematica, University of Torino, Italy.

DISTRIBUTION.—This species is known from Acapulco, Mexico, Costa Rica, Panama, and Ecuador.

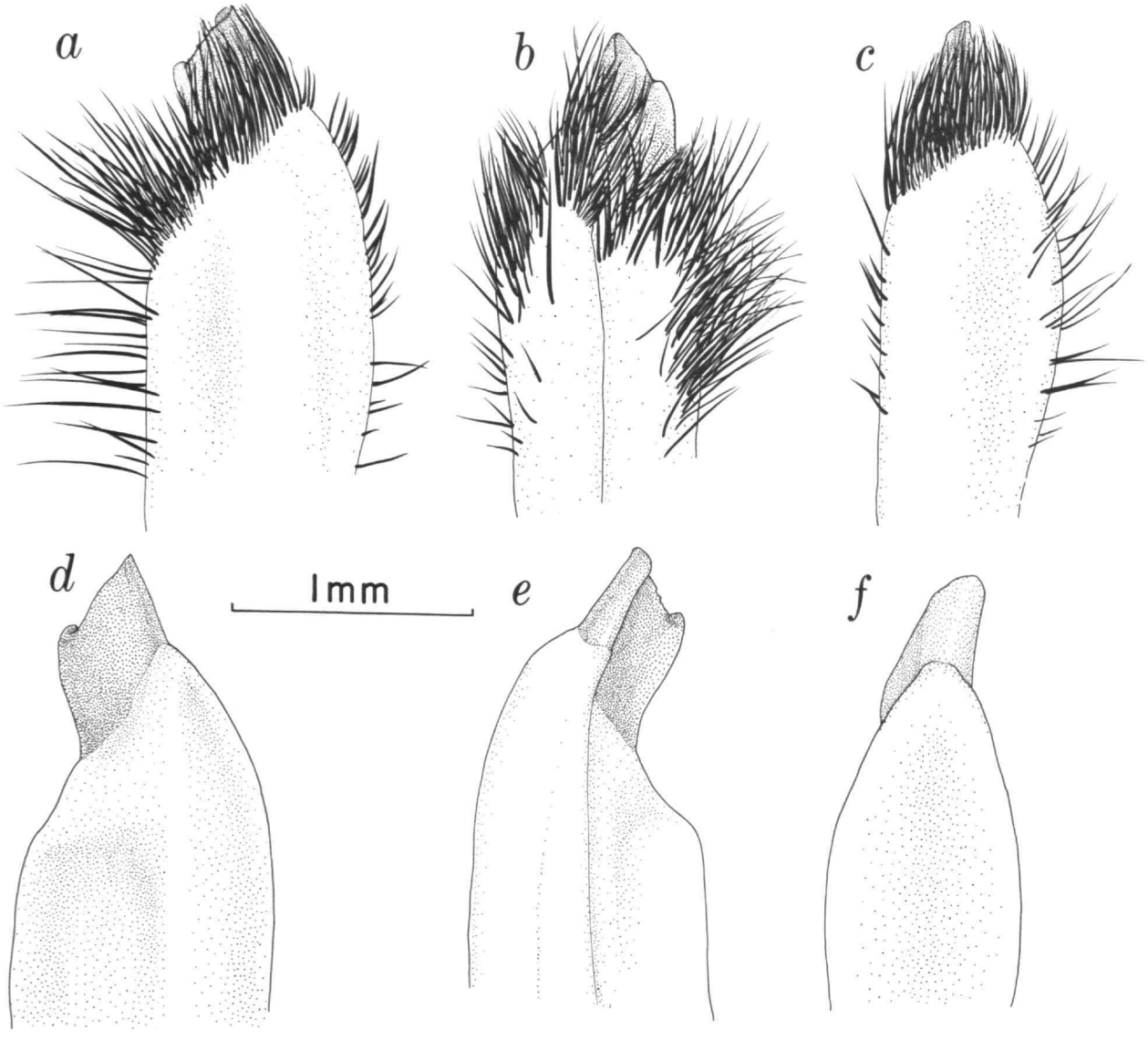

FIGURE 16.—*Sesarma aequatoriale*, gonopods (from Abele, 1977b, fig. 2).

HABITAT.—*Sesarma aequatoriale* is a semiterrestrial species that occurs in and adjacent to fresh and brackish water streams and rivers. Specimens of *S. aequatoriale* and pseudothelphusid crabs were collected from Rio Chepillo (actually a small stream) on Isla Rey in the Pearl Islands, Panama. An ovigerous female was collected from a large unnamed river that empties into Playa Grande, Isla San Jose, Pearl Islands, Panama. Specimens were also collected from mud flats adjacent to a brackish stream and in a brackish water mangrove swamp on the mainland of Panama. All of the specimens I collected were under rocks and debris; none was in a well-defined burrow. The salinity range of *S. aequatoriale* is 0 to 22.4‰ although the species appeared to be more common around lower salinity water. In freshwater streams *S. aequatoriale* occurs with pseudothelphusid crabs; at higher salinities it occurs at various localities with *S. sulcatum*, *S. rhizophorae* Rathbun, 1906, *S. rubinofforum* Abele, 1973b, and *A. occidentale* (Smith, 1870).

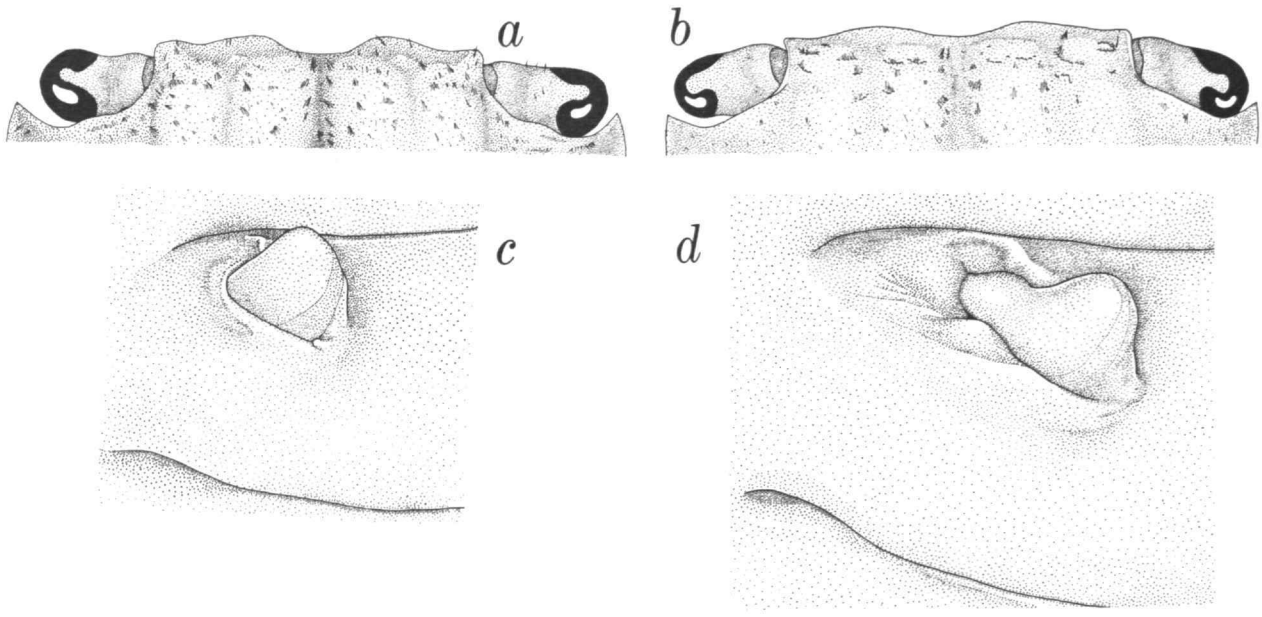

FIGURE 17.—*a–b*, front; *c–d*, gonopore. *a,c*, *Sesarma sulcatum; b,d*, *S. aequatoriale* (from Abele, 1977b, fig. 5).

REMARKS.—During the present study I examined two male and one female syntypes of *S. aequatoriale*, the female holotype of *S. sulcatum*, and all material referred to either species in the AHF, AMNH, MCZ, and USNM. With the exception of the syntypes, all material of *S. aequatoriale* was included under the name *S. sulcatum*. This problem accounts for the absence of records of *S. aequatoriale* in the literature and is understandable because the two species are morphologically very similar and are in part geographically and ecologically sympatric.

Rathbun correctly described and figured *S. sulcatum*, but specimens of *S. aequatoriale* were included in her "material examined" section (USNM 32315, 45532, 45569). The two species can be separated by the following characters: the carapace of *S. aequatoriale* has the frontal region weakly concave and the dorsal surface lightly grooved with widely scattered tufts of pubescence, whereas the carapace of *S. sulcatum* has the frontal region deeply concave and the dorsal surface deeply grooved and usually with close-set tufts of pubescence (compare Figures 15 and 18; 17*a* and 17*b*); the male gonopod of *S. aequatoriale* has a relatively longer endpiece and is less robust than the male gonopod of *S. sulcatum* (compare Figures 16 and 19); the female gonopore of *S. aequatoriale* differs from that of *S. sulcatum* (compare Figures 17*c* and 17*d*); *S. aequatoriale* is sexually immature at this size and does not appear to reach sexual maturity until approximately cb 23 to 30 mm.

Sesarma sulcatum Smith, 1870

FIGURES 5*j*, 17*a,c*, 18, 19

Sesarma sulcata Smith, 1870:156.—De Man, 1892a:260.
Sesarma (Sesarma) sulcata.—Rathbun, 1897a:90.
Sesarma (Sesarma s.s.*) sulcata*.—Tesch, 1917:200.
Sesarma (Sesarma) sulcatum.—Rathbun, 1918:289, pl. 78: figs. 3, 4 [part of material = *S. aequatoriale*].—Bott, 1955:62.—Von Hagen, 1978:46.
Not *Sesarma sulcatum*.—Crane, 1947:86 [part only].—Abele, 1976:268 [part of material only].
Sesarma sulcatum.—Crane, 1947:86.—Abele, 1977b:502, figs. 3, 4, 5a, 5b.—Brusca, 1980:302, fig. 20.11.—Abele, 1981:438.

MATERIAL EXAMINED.—Mexico: Gulf of California between Tiburon I. and Sonora mainland, 2♂, 1♀, 26 Oct 1969, P. Vreeland, AHF 1970-11; Gulf of California, Kino Bay, 1 ovigerous ♀, 4 Apr 1970, P. Pickens, C. Swift, AHF 1970-11; Nayarit, San Blas, 3♂, 1♀, H. Wright, AHF 1966-1; Concepcion Bay, 2♂, 28 Mar 1940, S.A. Glassell, 19 Jan 1932, USNM 110646; La Paz, 1♂, L. Beilding, USNM 4631; Puerto Escondido, 1♀, S.A. Glassell, USNM; San Blas, Tepio, 2♂, 1 ovigerous ♀, 14 Jun 1897, Nelson and Goldman, USNM 20653.

Nicaragua: Corinto; 1 ovigerous ♀ (holotype), J.A. McNiel, MCZ 6243 (transferred from the Peabody Academy of Science, November 1885).

Costa Rica: Golfito, 1♂, 6–7 Mar 1938, AMNH 13508.

Panama: Diablo Heights swamp, 3♂, 30 Jul 1967, H.O. Wright, USNM 125912, 125917; swamp near Albrook AFB,

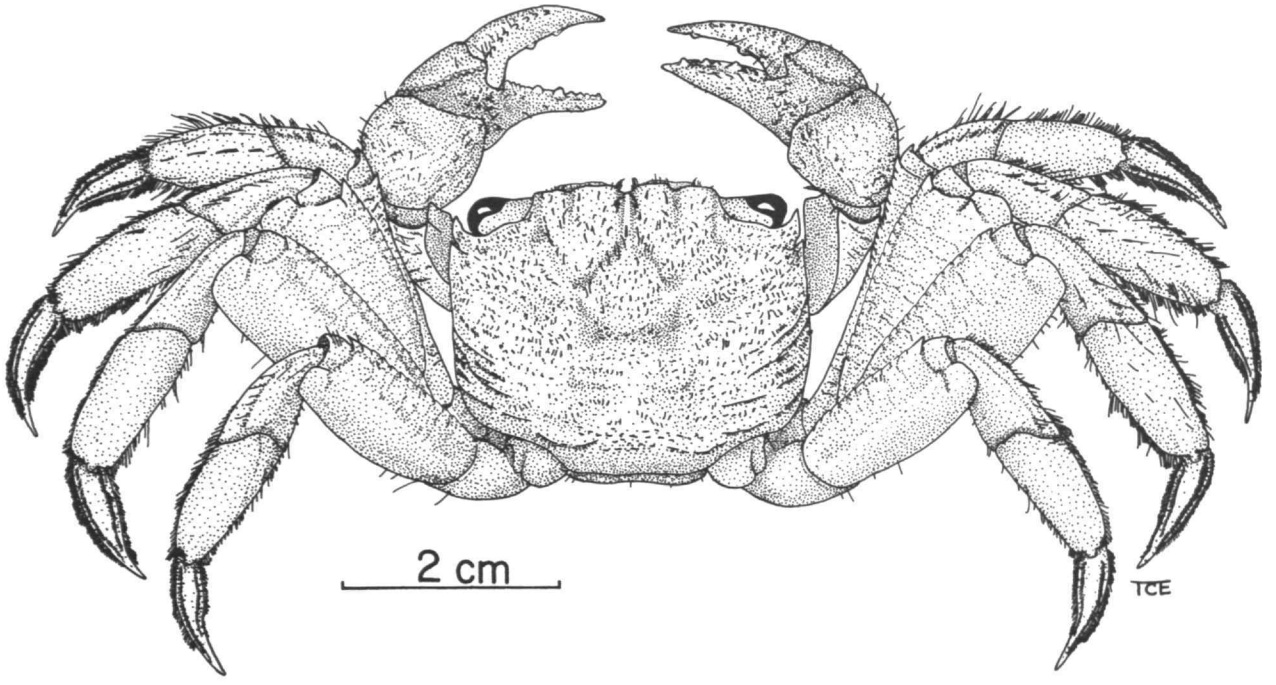

FIGURE 18.—*Sesarma sulcatum*, male, Panama (from Abele, 1977b, fig. 3).

1♂, 18 Jun 1974, L.G. Abele, USNM; Darien, El Real, 4♂, 1♀, 26 Oct 1966, R. Fish, USNM 125916.

Colombia: Port Utria, 1♂, 25 Jan 1935, AHF.

DESCRIPTION.—Carapace wider than long (cl/cb = 0.81±0.04 for males, 0.82±0.05 for females), covered dorsally with distinct tufts of setae. Carapace widens slightly posteriorly; tooth posterior to anterolateral angle, large acute and set higher and medial to anterolateral angle. Regions of carapace well defined especially in anterior portion where deep grooves mark interorbital region. Frontal region about 0.53 of carapace breadth (iw/cb = 0.53±0.02 for both sexes), sinuous with deep median portion.

Eyes well developed, pigmented.

Chelipeds sexually dimorphic, larger with more granules in males. Anterior medial border with about seven strong teeth, posterior border very weakly serrate with distinct lobe proximal to distal margin. Carpus covered with rows of granules, some acute at borders, and with a distinct impression on the anterolateral surface; medial surface with a few acute granules in males. Dorsal surface of palm with distinct row of granules extending slightly beyond distal margin; outer surface smooth to slightly punctate, inner surface with large granules in males, smooth in females. Movable finger with about 11 acute tubercles dorsally; ventrally with tuft of setae at base followed by one large tooth and about nine smaller ones to corneous spooned tip. Immovable finger with about 11 teeth proximal to corneous spooned tip.

Walking legs short, robust, ml/mw of third is 2.2±0.13 in males and 2.04±0.10 in females. Lateral rows of granules on merus with dorsal subdistal tooth. Rows of long dark setae beginning on carpus, extending onto dactylus as three ventral and three dorsal rows of thick setae. Pubescence particularly thick on propodus and dactylus of anterior two legs. About three or four pairs of short, thick black spines on distal margin of propodus.

Male abdomen subtriangular in outline; basal width of telson slightly greater than length at midline. Gonopod robust; amber-colored endpiece directed laterally bending at about a 45° angle.

Female abdomen semicircular in outline; basal width of telson slightly greater than length at midline. Gonopore oblong in outline; operculum longer than wide.

MEASUREMENTS.—Males cb 23.3 to 35.8 mm, large males to 50 mm (Brusca, 1980); females cb 24.7 to 30.7 mm; ovigerous females cb 30.2 to 30.5 mm.

TYPE LOCALITY.—Corinto, Nicaragua.

TYPE.—Ovigerous female (cb 30.5 mm) in the Museum of Comparative Zoology (MCZ 6243). Specimen is in poor condition.

DISTRIBUTION.—*Sesarma sulcatum* is known from the Pacific Coast of Mexico, Gulf of California, El Salvador, Nicaragua, Costa Rica, Panama, and Colombia.

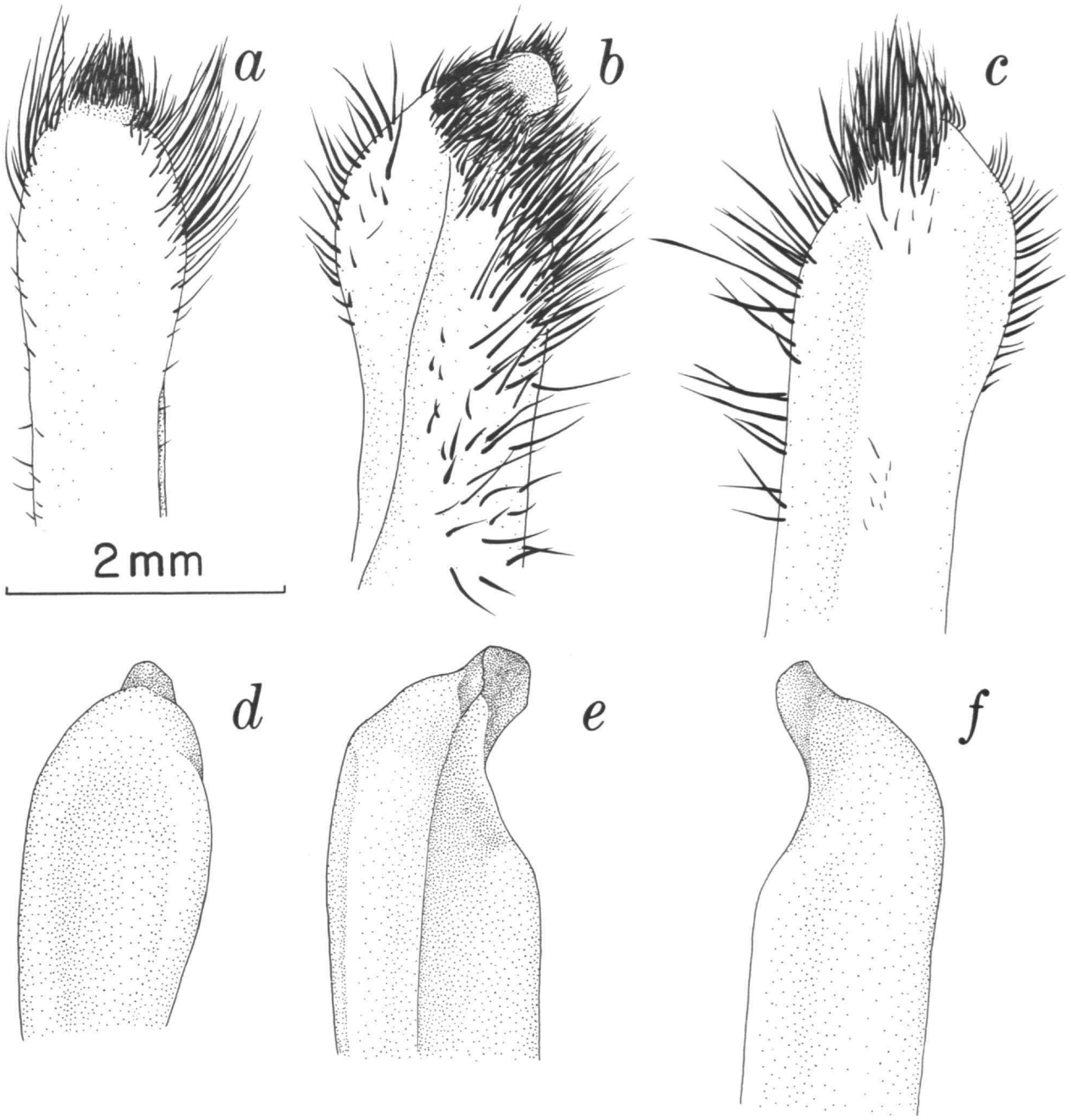

FIGURE 19.—*Sesarma sulcatum*, gonopods (from Abele, 1977b, fig. 4), Costa Rica.