

THE WESTERN ATLANTIC SWIMMING CRABS *CALLINECTES*
ORNATUS, *C. DANAEE*, AND A NEW, RELATED SPECIES
(DECAPODA, PORTUNIDAE)

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ABSTRACT

Former understanding concerning limits of variation and geographic range in the species *Callinectes ornatus* Ordway and *C. danae* Smith is altered by recognition of a new, closely related species, *C. similis*, from the Carolinian zoogeographic subregion. The two established species are redescribed and illustrated along with the new. Tables of measurements and comparisons, as well as a map, are included for easy reference.

INTRODUCTION

Specific differences between the Western Atlantic littoral portunid crabs *Callinectes ornatus* Ordway, 1863, and *C. danae* Smith, 1869, seemed well delineated by Rathbun (1930) until recently. People studying these crabs along the coast of the Carolinas and points southward in the United States found that many specimens seemed to share characters attributed to both species by Rathbun, and Lunz (1958) questioned whether or not what had been uncritically called *C. ornatus* for many years along the Carolinas was in reality *C. danae*. He sought counsel from other carcinologists, but received inconsistent determinations. Lunz reluctantly called his specimens *C. ornatus*, but left the question of their identity open.

Blue crab investigations initiated by the Bureau of Commercial Fisheries of the U. S. Fish and Wildlife Service at Beaufort, N. C.,

in 1957, were hindered by the same difficulty, for *Callinectes* species other than *C. sapidus* Rathbun contribute to commercial catches along this coast in a minor degree and occur in samples of crabs from commercially fished waters. Moreover, life history studies involving identification of *Callinectes* larvae from plankton, as well as studies on rearing the larval stages, depend on accurate identification. In view of these needs and problems, large series of the questionable *Callinectes* species were collected from the east coast of Florida in 1962 by Bureau personnel and turned over to me for study in an attempt to clarify the taxonomic confusion.

This material, together with that in the University of North Carolina Institute of Fisheries Research Collection (UNC-IFR), selected material from the U. S. National Museum (USNM), and types of both *C. ornatus* and *C. danae* from the Museum of Comparative Zoology, Harvard University (MCZ), and Peabody Museum of Natural History, Yale University (YPM), formed the basis for comparisons.

Callinectes ornatus and *C. danae* appear to be valid species. However, their striking structural similarities led to confusion in distinguishing between them in the past, and the hitherto unrecognized existence of a third species in North and Middle America added to the puzzle. One apparent source of

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confusion is the series of line drawings given by Rathbun (1930: Figs. 15b, d; 16a, b; 17a, b; 18b, d). Not all specimens fall clearly into categories suggested by these figures. In addition, Hay and Shore (1918) listed *C. ornatus* as common in the Carolinas, and in that area this became the identification of choice almost by neglect, with Williams (1965) perpetuating the error. The following discussion should clarify the status of previously known species, establish their geographic ranges insofar as available material allows, and stabilize identity of the undescribed northern form.

Anatomical features most helpful in distinguishing these species, features emphasized in the diagnoses following, are: shape of the intramedial area, a central dorsal, roughly trapezoidal configuration on the carapace, which in the genus *Callinectes* is a combination of the metagastric and urogastric regions; sizes of the median pair of interocular teeth on the frontal margin; sculpture on the carpus of the chelipeds; shape and position of the T-shaped male abdomen; and finally, shape of the first male pleopods. The pleopods are most diagnostic for the species, and in descriptions of them I have decided to broaden a terminology used by Stephenson and Campbell (1959). They spoke of the basal bulb, distal portion, and extreme tip. Each first pleopod can be described more minutely as consisting of a broad basal bulb, a narrowing intermediate portion, a slender distal portion of variable length designated after this as the shank, and the extreme tip. Aside from these features, there are no consistently distinctive spines, teeth, grooves, angles, proportions, or tufts of hair on any of the remaining legs or mouthparts among the three species.

Callinectes ornatus Ordway

Figs. 1; 4A, B.

Callinectes ornatus Ordway, 1863, p. 571.—Rathbun, 1896, p. 356 (in part); pl. 15; pl. 24, fig. 3; pl. 25, fig. 2; pl. 26, fig. 2; pl. 27, fig. 2.—1901, p. 48.—Verrill, 1908, p. 366.—Rathbun, 1930, p. 114 (in part); pl. 50; text-figs. 15b, 16a, 17a, 18b. *Callinectes diacanthus* A. Milne Edwards, 1879, p. 225 (variety).

Diagnosis.—Six frontal teeth including inner orbitals, submedian teeth often obsolete.

Intramedial area broad laterally and rela-

tively short anteroposteriorly as compared with *C. danae*.

Anterolateral teeth, except outer orbital and slender lateral spine, acute to progressively more acuminate laterally; first five with posterior margins longer than anterior margins, and distinctly separated by narrow-based, rounded notches; last two with margins approximately equal in length, with separating notches broader, next to last tooth distinctly more acuminate than last. Outer orbital and infraorbital teeth acute. Lateral spine trending definitely forward.

Carpus of chelipeds almost smooth dorsally; inferior lateral ridge terminating in a low tooth occasionally followed by an inconspicuous eminence.

Penultimate (fifth) segment of male abdomen relatively narrow, sides slightly constricted, not parallel; usually with distal segments 5 and 6 recessed below plane of sternum in retracted position. First pleopods of male each tapering from inflated basal bulb to slender tip reaching about level of suture between third and fourth thoracic sternite; curved in such manner that intermediate portion and proximal portion of shanks of each side overlap in situ (no overlap among young, but very close together); shanks becoming membranous distally, each with lanceolate tip on its own side of median sagittal plane of crab. Portion proximal to tip armed with short, backward pointing spinules quite visible at low magnification, somewhat more numerous and longer distally than proximally with tendency to arrangement in rows near tip on ventral and mesial margin; spinules extending proximally along shank to level of intermediate portion near basal bulb; spinules more numerous on mesial than on lateral edge near tip, but more numerous on lateral than on mesial edge proximally (small males with no spines proximally).

Measurements.—See Table 1.

Variations.—The median pair of interocular teeth are developed well enough in the dried syntype from Haiti to impair identification based on this character alone. Specimens from Bermuda have blunter anterolateral teeth than this dry specimen. Among young males especially, the sterno-abdominal surface may be plane and not recessed as in many adults.

From adult material in USNM, this spe-

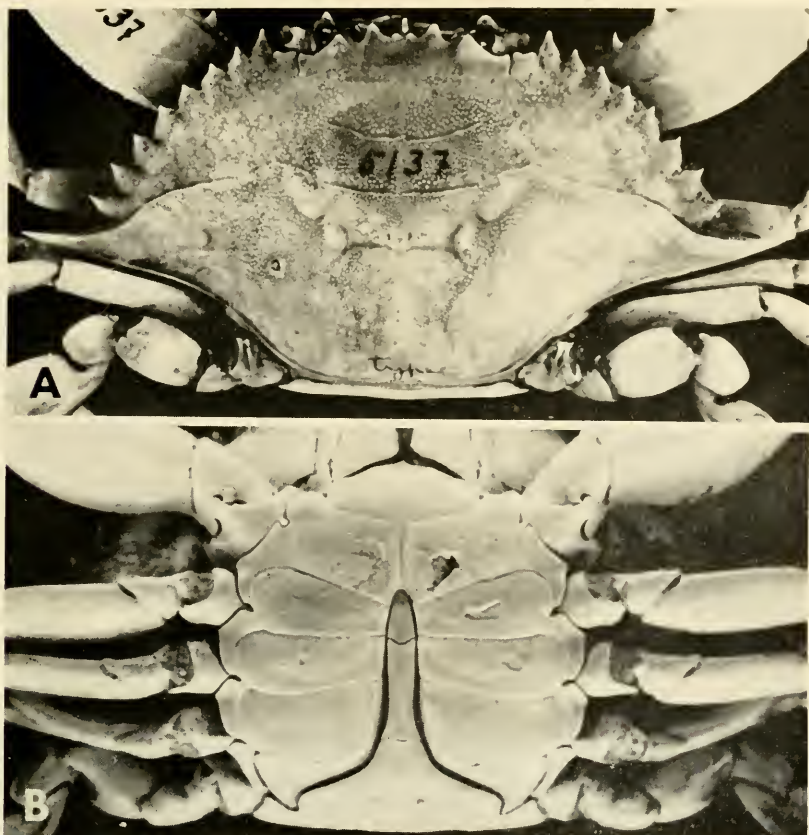


Figure 1. *Callinectes ornatus* Ordway, syntype male, Gonaives, Haiti, MCZ No. 5137; A, dorsal view of carapace, X 1; B, ventral view of sternal area slightly enlarged.

cies apparently shows far less variation than *C. danae*.

Color.—Adult males, Bermuda: Carapace dull olive to dark brown, usually with a large, ill-defined, roundish spot of orange or orange red on each side posteriorly; lateral spines and denticles light blue or whitish, white tipped. Eyestalks purple. Chelipeds proximally similar to carapace, spotted with blue and with spines pale blue, joints red; inner surface of palm white but with a large bright red patch bordered with purple; fingers mostly purple, tipped with red. Walking legs bright blue above, with a band of scarlet at each joint and a patch of paler blue or green on posterior and lower side of each article; dactyls red. Swimming legs similar in color but with red articular bands wider, a patch of orange or yellow on each article; dactyl with proximal blue band separated from distal scarlet band by an

orange band. Abdomen light blue posteriorly.

Many individuals less brilliantly colored, juveniles often dull or plain olive-yellow to greenish above. Some males more melanistic, exhibiting shades of dark brown and purple with accents of yellow and brownish red. Albinistic (or light hued) forms not uncommon. (After Verrill, 1908.)

Material examined.—Syntypes, MCZ, seven specimens; nine lots of adults from 140 lots, mostly juveniles or specimens returned to sender, USNM; two 5-gallon and some smaller lots from Florida collected by U. S. Fish and Wildlife Service Bureau of Commercial Fisheries personnel.

Type localities.—Gonaives, Haiti; Cumana, Venezuela; Bahamas; Tortugas [Florida]; Charleston, South Carolina.

Known range.—The species as here restricted has a geographic distribution ex-

tending from an extreme northern limit at Charleston, South Carolina, along eastern and southern Florida, and the Atlantic continental coast from the eastern shore of Yucatan Peninsula to Surinam; throughout the Lesser and Greater Antilles and Bahama Islands; and Bermuda (Fig. 5).

Remarks.—Though type material from Charleston appears to be *C. ornatus*, (immature males and females, and small adult females), it is a matter of some concern that the stated origin of these specimens is from a locality representing an apparent extreme northern limit of geographic range. No other specimens of this species are known to me from the Carolinas, though I have seen immature specimens from near Jacksonville in northern Florida. The species is much more abundant in the Miami area nearer its geographic center in the Caribbean Sea.

Callinectes danae Smith

Figs. 2; 4C, D.

Lupa dicantha Dana, 1852, p. 272.—1855, pl. 16, figs. 7a-c.

Callinectes diacanthus: Ordway, 1863, p. 575.—A. Milne Edwards, 1879, p. 226 (variety).

Callinectes danae Smith, 1869, p. 7.—Rathbun, 1896, p. 357, pl. 16; pl. 24, fig. 4; pl. 25, fig. 3; pl. 26, fig. 3; pl. 27, fig. 3.—1901, p. 48.—Verrill, 1908, p. 370 (?).—Rathbun, 1930, p. 118 (in part); pl. 51; text-figs. 15d, 16b, 17b, 18d.—Lemos de Castro, 1962, p. 39; pl. 2, fig. 9.

Diagnosis.—Six frontal teeth including inner orbitals, submedian pair short but distinct.

Intramedial area narrow laterally and relatively long anteroposteriorly as compared with *C. ornatus*.

Anterolateral teeth, except outer orbital and slender lateral spines, intermediate in length between *C. ornatus* and new species described below; tips of first three teeth nearly rectangular with posterior margins somewhat longer than anterior margins, teeth separated by narrow-based rounded notches; remaining teeth, especially sixth and seventh, acuminate, resembling those of *C. ornatus*.

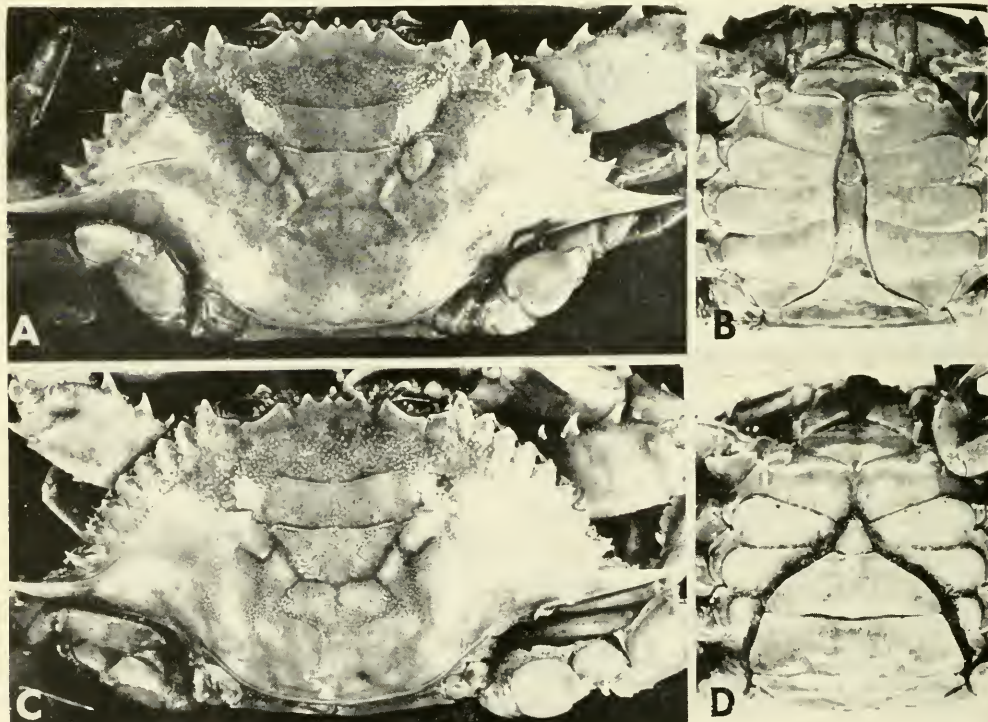


Figure 2. *Callinectes danae* Smith, syntypes, Recife (= Pernambuco), Brazil, YPM No. 824. Male, A, carapace in dorsal view, B, sternal area in ventral view; female, C, carapace in dorsal view, D, sternal area in ventral view, slightly reduced.

having anterior edges concave, and posterior edges somewhat convex. Outer orbital and infraorbital spines somewhat blunted. Lateral spine extending straight laterally or curved slightly forward.

Carpus of chelipeds with upper surface bearing slightly developed, interrupted ridges trending longitudinally with axis of limb, ridges bearing obsolescent granules often better developed in males than in females; inferior lateral ridge terminating in a strong lateral spine or tooth often followed by a strong eminence.

Penultimate (fifth) segment of male abdomen with sides almost parallel, only a slight constriction in proximal half preceded and succeeded by converging margins; distal segments 5 and 6 only somewhat recessed below plane of sternum in retracted position. First pleopods of male each tapering from inflated basal bulb to slender tip reaching about level of suture between second and third thoracic sterna; curved in intermediate portion in such manner that shanks of each side are either somewhat overlapping or almost contiguous in situ; shanks becoming membranous, narrow and trough-shaped distally with tips bent ventrolaterally. Distal half of each shank with minute spines hardly visible at low magnification on dorsal aspect and, in addition, two well separated, exceedingly slender longer spines on bent portion distally.

Measurements.—See Table 1.

Variations.—The first pleopods of males vary somewhat in length individually, being either a little longer or more often shorter than as diagnosed above. The tips of these appendages, too, are subject to individual variation, usually curving ventrolaterally, but often ventromesially, laterally, mesially, or seldom straight, asymmetrical, or sinuously curved. Some specimens have the prominent, sparse, terminal setae; some do not. In some, the lateral fine setae are more evident than in others. Usually the cross suture between abdominal segments 5 and 6 is anterior to the suture between the second and third thoracic sterna. Constriction of abdominal segment 5 appears to be more pronounced in large mature males than in immatures in which the segment is not only more nearly parallel sided but also relatively broader than in older crabs.

Color.—Half grown male, Ilha São Sebastião, State of São Paulo, Brazil (USNM

No. 61002): Carapace a sort of sage green [grayish green] and medium brown with porcelain white patches, frontal area dark red, teeth yellow grading through whitish to white tips. Chelipeds similar, medium brown with greenish tinge, spines nearly all porcelain white, entire outer margin, and inner margin of carpus, dark brown; inner surface of hand and carpal articulation china blue; fingers all white. Articles of walking legs china blue, merus more heavily stippled from distal end to middle, a sort of cinnamon color mixed with white between legs; dactyls orange-red to scarlet. Swimming legs like chelipeds, margins of articles salmon near articulations; dactyl transparent but reddish to brownish yellow distally, white on proximal half and adjacent propodus. Underparts whitish. (Modified after Schmitt in Rathbun, 1930.)

Material examined.—Types, MCZ and YPM; 24 to 96 lots, USNM.

Type locality.—Recife (= Pernambuco), State of Pernambuco, Brazil.

Known range.—The species as here restricted has a geographic distribution extending from the northern coast of Cuba, through the Greater and Lesser Antilles, as well as along the Atlantic continental coast, from British Honduras to the State of Santa Catarina, Brazil (Fig. 5).

Callinectes similis sp. n.

Figs. 3; 4E, F.

Callinectes ornatus: Rathbun, 1896, p. 356 (in part).—Hay and Shore, 1918, p. 433; pl. 34, fig. 2.—Rathbun, 1930, p. 114 (in part).—Williams, 1965, p. 172, fig. 152.
Callinectes danae: Rathbun, 1930, p. 118 (in part).

Diagnosis.—Six frontal teeth including inner orbitals, submedian pair short but distinct.

Intramедial area narrow laterally and relatively long anteroposteriorly, intermediate in shape between *C. ornatus* and *C. danae*.

Anterolateral teeth, except outer orbital and slender lateral spine, broad, distinctly separated by narrow-based, rounded notches, tips of first five nearly rectangular; tips of sixth, and especially seventh, acuminate with separating notches broader. Outer orbital and infraorbital spines prominent and, especially outer orbital, acuminate at tip. Lateral spine strong, curved forward.

Carpus of chelipeds with upper surface

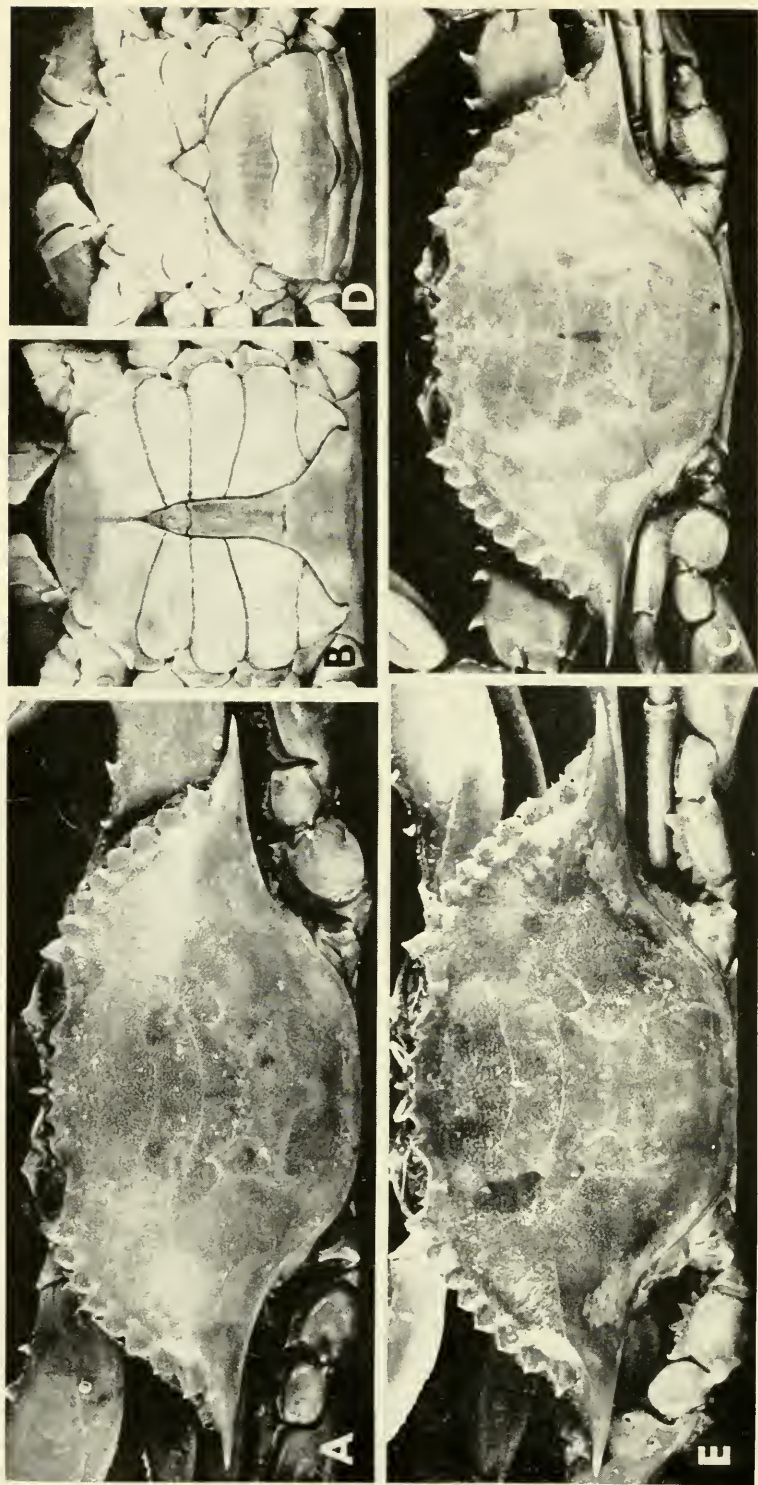


Figure 3. *Callinectes similis* sp. n., holotype male, A, carapace in dorsal view, B, sternal area in ventral view; paratype female, C, carapace in dorsal view, D, sternal area in ventral view; paratype male, near Beaufort Inlet, N. C., E, carapace in dorsal view; X 1.

bearing two obsolescent granulate ridges and suggestion of others; inferior lateral ridge terminating in a strong anterior spine followed by a low, oblique, granulate, dorso-ventrally flattened eminence.

Penultimate (fifth) segment of male abdomen having an extremely slight constriction in proximal half preceded by converging margins; distal segments 5 and 6 not recessed below plane of sternum in retracted position. First pleopods of male each tapering from inflated basal bulb to slender tip reaching zone at level of fourth thoracic sterna; pleopods widely separated in situ. Basal bulb narrowing through intermediate portion to slender shank more abruptly than in *C. ornatus*, often giving rise to a slight shoulder on mesial border just proximal to constriction on intermediate portion. Shank slender, nearly straight and parallel sided to near unadorned, somewhat membranous tip bent slightly mesiad. Shank armed with scattered, minute, backward pointing spinules, less numerous and somewhat smaller than in *C. ornatus*; most dense and largest distally, becoming very small and scattered proximally in intermediate portion, spinules more dense laterally than mesially.

Description, holotypic male.—Carapace, including lateral spines, about 2.2 times as wide as long, moderately convex, lightly and almost uniformly granulate dorsally except smooth along posterolateral and posterior slopes of dorsum, nearly smooth along anterolateral and anterior margins, especially between teeth and along orbits; smooth areas with tendency to iridescence; a symmetrically sinuous granulate line extending from side to side and a shorter arcuate line between this and frontal margin; intramedial area moderately long and narrow, resembling *C. danae* more than *C. ornatus*. Six frontal teeth including inner orbitals; submedian teeth short but distinct, intermediate teeth exceeding inner orbitals. Anterolateral teeth broad, each pair distinctly separated by a narrow-based, rounded notch; tips of first five nearly rectangular with anterior margins shorter than posterior; tips of sixth, and especially seventh, acuminate with separating notches broader; notches between teeth each with a shallow pit on adjacent dorsal surface. Lateral spine strong, slender, curved forward, scarcely as long as space occupied by three preceding teeth. Outer orbital spines acuminate, inner edge straight, outer sinuous;

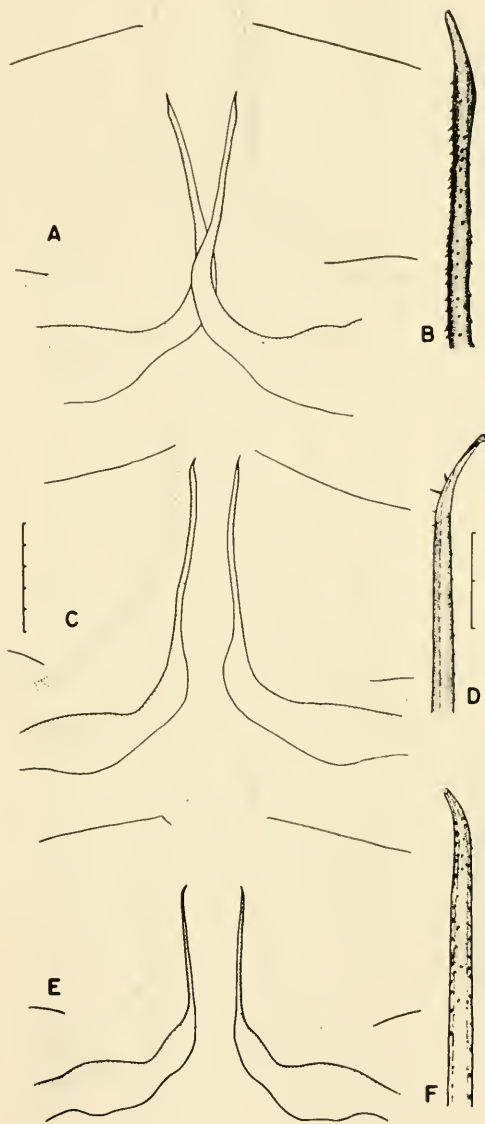


Figure 4. Outlines of first pleopods of males in situ with abdomen removed, flanked on right by enlarged views of left pleopod tips in ventral view. *Callinectes ornatus* Ordway, A, B, specimens from Florida off Biscayne Bay. *C. danae* Smith, C, Cardenas Bahia, Cuba (specimen showing shorter and more widely spaced pleopods than "typical"); D, MCZ syntype No. 5143. *C. similis* sp. n., E, paratype from type locality; F, paratype from near Beaufort Inlet, N. C. Each subdivision on scales = 1 mm.

infraorbital spines prominent and projecting beyond level of slender rostrum.

Chelipeds large and powerful, armed with sharp strong spines and with pincers asymmetrically modified as a crusher (right) and cutter (left). Merus with three spines in front and a single small one at distal end behind, proximal to this a transverse groove and spiniform shoulder. Carpus with two lateral granulate ridges, the inferior terminating in a strong spine followed by a low, oblique, granulate, dorsoventrally flattened ridge continuous with condyle articulating with palm; dorsal side with two obsolescent, granulate ridges, a long radial ridge and a shorter faint superior ridge with suggestion of still others trending longitudinally with axis of limb. Hand strong, prominently ribbed with longitudinal, granulate ridges; three superior ridges continued on superior surface of dactyl; a strong proximal spine at superior articulation with carpus and a low distal spine on palmar portion of supero-internal ridge; median internal and external ridges confined to body of hand; external inferior ridge strongest at base of immovable finger. Fingers nearly straight and strongly toothed, with incurved pointed tips crossing each other when closed.

Abdomen in form of inverted T; basal segments broad, distal segments narrow. Terminal segment (sixth) approximately oblong-lanceolate in outline, separated from penultimate (fifth) segment by a symmetrically sinuous movable suture at level slightly advanced beyond suture between second and third thoracic sterna; penultimate segment slightly sinuous sided but broader at all levels than terminal segment, proximal half slightly constricted laterally and less indurated than other parts, suture forming connection to proximal portion of abdomen almost completely fused; distal segments 5 and 6 not recessed below plane of sternum in retracted position. First pleopods each narrowing from broad basal bulb, through definite intermediate portion more abruptly than in *C. ornatus*, to slender tip reaching zone at level of fourth thoracic sterna; pleopods widely separated in situ. Shank slender, nearly straight and parallel sided to near unadorned, somewhat membranous tip bent slightly mesiad. Shank armed with scattered, minute, backward pointing spinules, less numerous and somewhat smaller than in *C. ornatus*; most dense and largest distally, be-

coming very small and scattered proximally near intermediate portion, spinules more dense laterally than mesially.

First, second, and third walking legs, as well as modified paddlelike last legs, with no features distinctive from other *Callinectes* species; first to third each with conspicuous fringe of hairs on posterior edge of propodus and dactyl, a shorter fringe on anterior edge of dactyl; paddlelike last leg with hairy fringe on all edges except posterior of carpus and merus and edges of more proximal articles.

Mature and immature paratypic females.—Abdomen of mature female broad, rounded, loosely covering much of posterior sternal plastron, terminal segment approximately in shape of equilateral curvilinear triangle lodged anterior to sternal suture between first and second walking legs. Immature female with abdomen triangular; terminal segment borne at same level as adult, shape between that of mature male and female; proximal segments fused, not movable as in adult. Carapace more inflated dorsally, yet proportionally no more deep bodied than male; lateral spines and chelipeds relatively weaker than in male.

Measurements.—See Table 1.

Variations.—Width of the gap between the first pleopods of males is subject to variation but the pleopods never lie in contiguity. There is some variation in length of the male pleopods, in relative development of the median interocular teeth, and especially in shape of the intramedial area. In addition to individual variation, this feature changes in shape with age.

Color.—Adult male, Beaufort Inlet, North Carolina: Carapace green dorsally, irregular areas of iridescence at bases of, and between, anterolateral teeth, and on posterior and posterolateral borders. Chelipeds and portions of legs similar in color or more tannish green dorsally, with iridescent areas on outer and upper edges of carpus and hands; chelae white on outer face, blue to fuchsia on inner surface, with fuchsia on tips of fingers and teeth of opposed edges. Lateral spines and some anterolateral teeth, as well as spines on chelipeds, white tipped. Walking legs grading from fuchsia distally through violet blue to light blue mottled with white proximally, pubescence on legs beige. Swimming legs variably mottled with white; all legs

TABLE 1.

Measurements for type material of three closely related, partially sympatric species of *Callinectes*.

Measurements in mm	<i>C. ornatus</i>					<i>C. donae</i>					<i>C. similis</i>						
	Gonaives, Haiti, 1860, Coll. A. Hilchenbach. MCZ No. 5137	Cumana, Venezuela, 1859, Coll. Capt. Couthouy. MCZ No. 5136	Charleston, S. C. Coll. L. Agassiz. MCZ No. 5128			Charleston, S. C. MCZ No. 5210		Pernambuco, Brazil, 1867, Coll. C. F. Hartt. YPM No. 824		Pernambuco, Brazil, 1867, Coll. C. F. Hartt. MCZ No. 6143		2 to 3 miles off beach between St. Johns River Jetties and Jacksonville Beach, Florida, 18 June, 1962. USNM Nos. 113341 (holotype) & 113342 (mature ♀ paratype).				Off Beaufort Inlet, Carteret County, North Carolina, 31 October, 1962.	
	Syntype	Syntype	Syntypes			Labelled "Types"				Syntypes		Holotype		Paratypes		Paratypes	
	♂	♂	♂♂	♀♂	♀	♂♀	♂♀	♂	♀	♂♀	♂♀	♂	♂	♀	♀	♂	♂♀
Length in midline excluding rostrum	47	40.3	27.3	26.5	37	30.1	31.6	42.6	42.2	40.3	40.4	45.7	34.7	31	40	46.5	39.8
Width including lateral spines	103	80	58*	58.5	79	62*	67.1	97.5	95	93.4	92	101.3	77.4	67.4	88.9	104.3	86.6
Width to base of lateral spines	82	65.9	48	45.6	62.9	49.8	53.3	77	74.5	73.1	71	80.4	61.5	52.6	69	81.2	79
Width between outer orbitals	38	32	23.3	22.6	30	24.9	25.8	35	36	33.2	33.3	36.6	27.5	24.8	31.5	37*	32
Width between inner orbitals	18	14	10.6	9	13	10.2	11.4	14	15	12.7	13.6	14.5	11	9	12.5	14.5	12.5
Width between infraorbitals	21	17.5	12.7	11.7	16.5	13.6	13.9	18.6	20.5	18	18	20.5	15	13.3	17.3	19.5	16*
Width between prominent interorbitals	8.5	6.9	5	4.6	5.8	4.8	5.4	6.7	7	6.4	6.5	7	5.5	5	6.9	6.8	6.2
Maximum height of body	27	22.3	15.6	15.3	21.8	17.2	17.8	23.4	24.3	21.7	22	24.8	19.3	18.8	22.8	25.6	23
Male Abdomen																	
Width 3d segment	34.5	27.9						27.2		27.6		32.5*	26.5				33.6
Length fused segs. 3 and 4 in midline	13.4	11.1						11.2		10.9		11.8	9.8				29.7
Length 5th segment in midline	11.5	9.2						12.4		10.3		12	9.2				12.5
Narrowest width 5th segment	3.3	2.7						3.4		3.2		5.1	4.6				4.7
Mature Female Abdomen																	
Width basal (1st) segment					29.2	24.6	25.9		32.1		30.5				31.1		33
Width 2d segment					30.5	24.8	26		31.6		30.5				32.6		34
Width largest (4th) segment					27.1	21.1	27.7		29		28				30.5		29.7
Length 4th segment in midline					7.4	5.7	6		8.4		8				8.2		8.6
Length segment 2-6 in midline					23.9	18.3	19.5		26.8		26.4				27		27
Intramедial Area																	
Anterior width	22	18	12.4			14.3	15.5	17	18	16	17.4	20.5	14.5	14	18.5	20	19
Posterior width	14	10.8	7.9			9.1	9.4	10	10.6	9.5	10.7	11.5	9	8	11	12.5	10.4
Median length	7	5.8	3.8			4.7	5.4	7.5	7.5	7.4	7.5	7.1	5.8	5	6.7	6.8	6.7
Lateral, angular, length	8.8	7.6	5.5			5.4	6.5	8.5	8	8	8.2	9	7	6.5	8.5	9	9

* Estimated measurement

† Immature

‡ Badly broken specimen

§ Ovigerous female



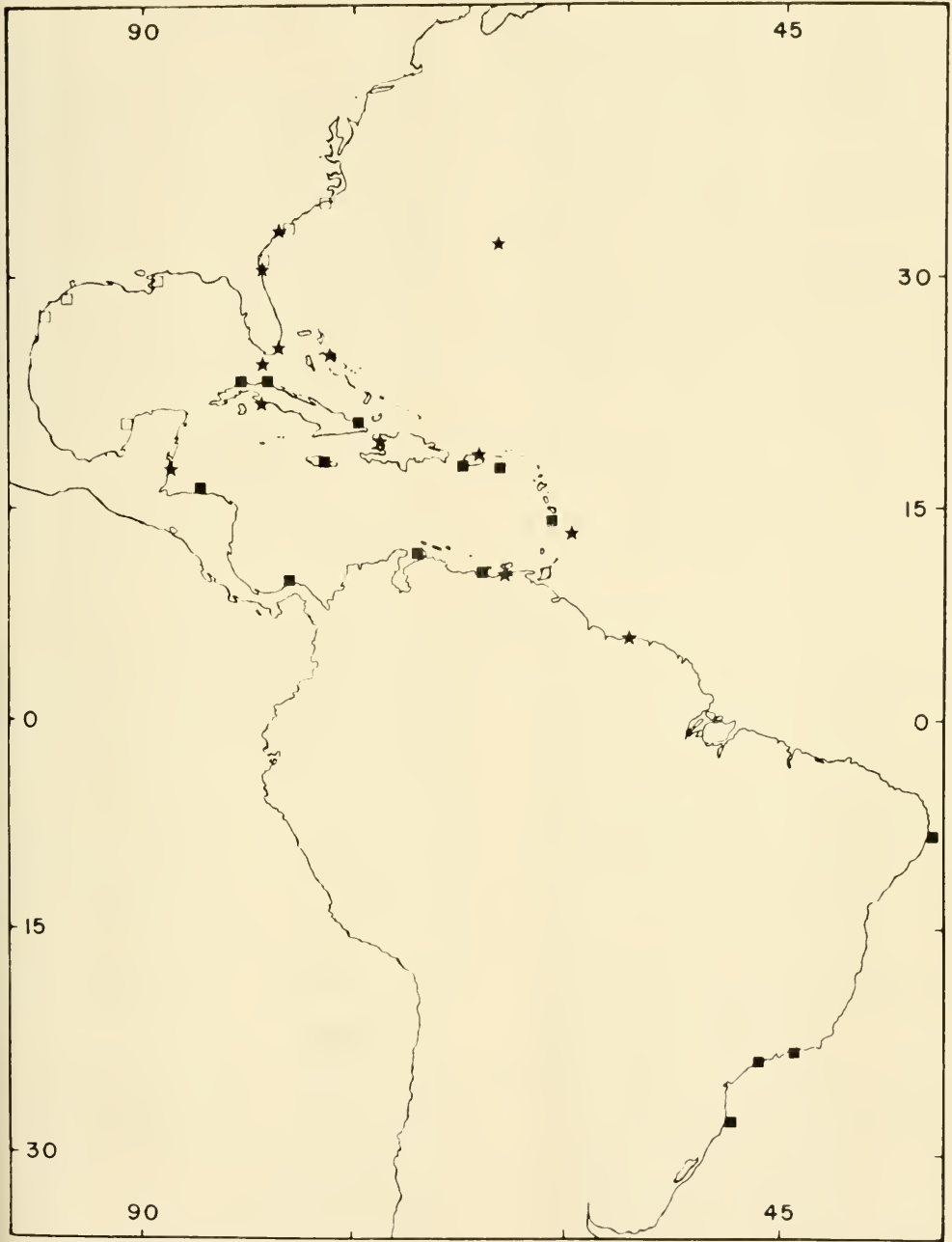


Figure 5. Geographic ranges represented by specimens studied; $\square$ *Callinectes similis* sp. n.; $\star$ *C. ornatus* Ordway; $\blacksquare$ *C. danae* Smith.

with stellate fuchsia markings at articulations. Underparts white and blue.

Ovigerous female, Beaufort Inlet, North Carolina: Similar to male except with more violet blue on inner surface of chelae; fingers

either with white teeth or fuchsia colored teeth. Legs with dactyls reddish orange grading abruptly to blue on propodi, pubescence brown to beige. Abdomen with iridescent areas. (After Williams, 1965.)

Material examined.—Several 5-gallon and smaller lots collected by U. S. Fish and Wildlife Service, Bureau of Commercial Fisheries personnel; 17 lots in UNC-IFR; several lots labelled "*C. ornatus*" in USNM.

Type locality.—Two to three miles off beach between St. Johns River jetties and Jacksonville Beach, Florida.

Known range.—New Jersey to State of Campeche, Mexico.

Disposition of types.—The male holotype (No. 113341), female paratype (No. 113342), and a series of paratypes have been placed in the USNM; also, series of paratypes have been placed in the MCZ, YPM, and UNC-IFR.

Relationships.—*Callinectes similis* appears to be most closely related to *C. ornatus* and *C. danae*.

Remarks.—The great similarity of this

species to its congeners suggested the name *similis*.

In Texas, Daugherty (1952) reported both a spring and fall breeding season for *C. similis* (= *danae*) with egg mass formation occurring in Gulf waters of 15 to 40 fathoms and in bays when salinities were comparable to those of the Gulf. Lunz's (1958) report of ovigerous females from South Carolina in May, August, and September, their occurrence as late as November in North Carolina (Williams, 1965), and in June and July among paratypes from north-eastern Florida suggests that spring and fall may represent only peaks in occurrence of egg-bearing females along the Atlantic shore.

DISCUSSION

For rapid identification, a list of comparisons is given in Table 2. These char-

TABLE 2
Distinctive features exhibited by three closely related partially sympatric species of Callinectes.

	<i>C. ornatus</i>	<i>C. danae</i>	<i>C. similis</i>
Intramedial area.	Wide & short.	Narrow & long.	Intermediate between other two.
Median pair interocular teeth.	Slightly developed or absent.	Present.	Present.
Carpal teeth & dorsal ridges.	Low lateral tooth. Smooth dorsally.	Strong lateral tooth or teeth. Dorsal ridges present.	Strong lateral tooth & a distal lateral eminence. Low dorsal ridges present.
Male 1st pleopods.	Often crossed near base. Flared portion of tip lanceolate. Spines on narrow shank quite visible at low magnification. Tips reaching to about level of suture between 3d & 4th thoracic sterna.	Somewhat crossed to somewhat separated. Trough-shaped tip bent usually ventrolaterally. Few spines on narrow shank hardly visible at low magnification. Tips reaching to level of suture between 2d & 3d thoracic sterna.	Not crossed, well separated. Plain tip bent mesially. Few minute spines on narrow shank. Tips reaching to zone at level of 4th thoracic sterna.
Male abdomen.	Usually recessed below plane of sternum. Sides not parallel.	Somewhat recessed. Sides almost parallel.	Not recessed. 5th segment slightly constricted.
Geographic distrib.	S. C. (?), Fla.; Caribbean area to northern South America; Bermuda.	Caribbean area to southern Brazil.	New Jersey to Campeche, Mexico.

acters distinguish almost all of the specimens examined by me. However, two areas from which doubtful specimens were found should be mentioned. Some individuals from northern Cuba (Fig. 4C) and others from near the Canal Zone in Panama present puzzling combinations of *similis-danae* characters. Both of these areas are beyond the known range of *C. similis* but within that of *C. danae*. Such specimens, few in number, may represent extremes in variation of *C. danae*, but no solutions are possible until more are available for study.

Finally, a high incidence of the sacculinid parasite, *Loxothylacus texanus* Boschma was noted in a large series of *C. ornatus* from Biscayne Bay, Fla. Reinhard (1950) discussed occurrence of this parasite on *C. sapidus*, but never on *C. similis* (= *danae*) in the Gulf of Mexico, and also noted its occurrence on *C. marginatus* in Panama. I have not seen *L. texanus* on *C. similis*.

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