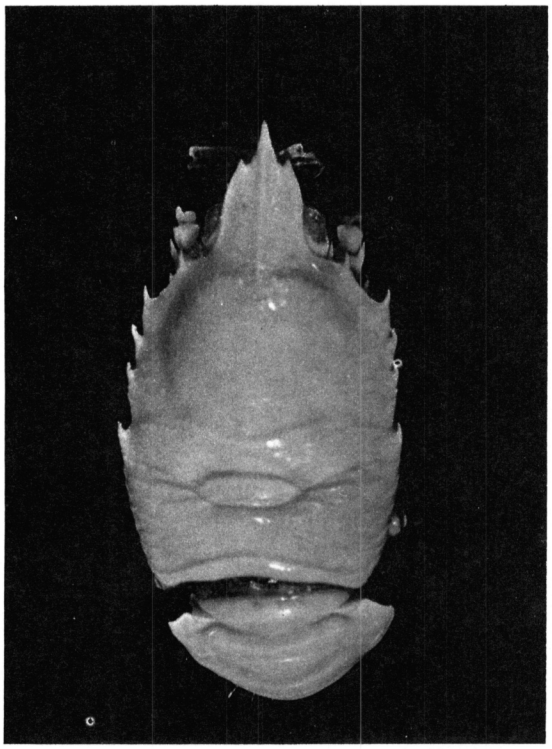

Figure 5-14. Munidopsis tridentata (Esmark). Female from station 64-A-10-3 (431 fms.). x 10.

Munidopsis spinoculata (A. Milne Edwards, 1880)

Orophorhynchus spinoculatus A. Milne Edwards, 1880, p. 59.
Munidopsis spinoculata. – A. Milne Edwards & Bouvier, 1894, p. 275; 1897, p. 75, pl. 6, figs. 8-11. – Benedict, 1902, p. 276. – Chace, 1942, p. 86.

Previous Gulf of Mexico Records

None.

Alaminos Material

Southwest Gulf: 69-A-11-27 (425-450 fms.), 1 ♂; 69-A-11-69 (750 fms.), 2 ♂.

Remarks

Alaminos specimens range in size from 6 to 10 mm carapace length. This species has only been taken twice before–the type-material by the *Blake* off Dominica, and the *Atlantis* material off the north coast of Cuba (Chace, 1942). The *Alaminos* material is the first record in the Gulf of Mexico proper. Its SW Gulf location is quite far removed from the previous eastern records. Depth range: 425-824 fms.

Munidopsis tridens (A. Milne Edwards, 1880)

Galathodes tridens A. Milne Edwards, 1880, p. 57. – A. Milne Edwards & Bouvier, 1894, p. 279; 1897, p. 96, pl. 7, figs. 13-15, pl. 8, fig. 1.
Munidopsis tridens. – Benedict, 1902, p. 328. – Chace, 1942, p. 87.

Previous Gulf of Mexico Records

Southeast Gulf: *Atlantis* sta. 3303 (260 fms.), (Chace, 1942).

Alaminos Material

None.

Remarks

Only two specimens of *M. tridens* are known–the *Blake* specimen from off St. Kitts and the *Atlantis* specimen from off the north coast of Cuba. Depth range: 208-260 fathoms.

Munidopsis tridentata (Esmark, 1857 ?)
(Figure 5-14)

Restricted Synonymy

Galathea tridentata Esmark, 1857, p. 239.
Galathodes rosaceus A. Milne Edwards, 1881, p. 932; 1883, pl. 15.

Galathodes tridentata. – G. O. Sars, 1883, pp. 4 and 43, pl. 1, fig. 3.
Munidopsis tridentata. – Ortmann, 1892, p. 256. – Chace, 1942, p. 88.
Munidopsis rosacea. – Alcock and Anderson, 1899, p. 19.
Munidopsis (Galathodes) ? tridentata. – Alcock, 1901, p. 264.

Previous Gulf of Mexico Records

Southeast Gulf: *Atlantis* stations 2995, 2996 (370-665 fms.), (Chace, 1942).

Alaminos Material

Northwest Gulf: 64-A-10-3-dredge (431 fms.), 1 ♀.

Remarks

There is some doubt as to the identification of this specimen, primarily because of its small size (carapace with rostrum length 6 mm) and the absence of legs. It differs sufficiently from *M. tridens* (absence of gastric spines, presence of pronounced carina on rostrum, etc.) to remove that species from contention.

Distribution

Chace (1942) points out that this is one of the most widespread species of *Munidopsis* known. It has been found in the eastern Atlantic from Norway through the Bay of Biscay to the west coast of Africa and the Cape Verde Islands; in the western Atlantic off the north coast of Cuba; in the NW Gulf of Mexico; and in the Indian Ocean.

Family CHIROSTYLIDAE

The carapace is longer than broad. Thoracic sternum is broad, the last segment generally much reduced or atrophied.

The abdomen is folded on itself, and the telson is also folded beneath the preceding abdominal segments.

The antennal peduncle has five joints, the third segment not being fused with the second. No epipodite on third maxilliped.

Nine species of chirostylids in three genera (*Eumunida, Gastroptychus,* and *Uroptychus*) are known from the Gulf of Mexico. Of these, only one species, *Uroptychus nitidus,* was taken by the *Alaminos.* The other eight species are listed in Table 5-1.

Key to the Genera of Chirostylidae
(after Chace)

1. Two pairs of supraorbital spines; carapace crossed by transverse ciliated lines; mandibles unarmed.
Eumunida
No supraorbital spines; carapace without transverse ciliated lines; mandibles dentate.
2
2. Rostrum and antennal scale lacking.
Chirostylus
Rostrum and antennal scale present.
3
3. Legs spiny and very long.
Gastroptychus
Legs short or of moderate length and not densely spinose.
Uroptychus

Genus *Uroptychus* Henderson, 1888
Uroptychus nitidus (A. Milne Edwards, 1880)
(Figure 5-15)

Diptychus nitidus A. Milne Edwards, 1880, p. 62. – A. Milne Edwards & Bouvier, 1894, p. 306; 1897, p. 134, pl. 11. figs. 21-22, pl. 12, figs. 10-16.
Uroptychus nitidus. – Henderson, 1888, p. 174, pl. 21, fig. 6. – Benedict, 1902, p. 292. – van Dam, 1933, pp. 37 and 41. – Chace, 1942, p. 11, text-figs. 3-6.

Figure 5-15. Uroptychus nitidus (A. Milne Edwards). Ovigerous female in the gorgonian Chrysogorgia elegans. Taken from station 69-A-11-27 (425-450 fms.). x 1.0.

Chace (1942) clarifies the four varieties of *U. nitidus,* two of which (the Typical Form and Variety B) were taken by the *Alaminos.*

Milne Edwards (1880) states that *Uroptychus nitidus* lives in a gorgonian coral *(Chrysogorgia).* No further elaboration was given. Chace (1942) was unable to verify Milne Edwards' statement. Fortunately, additional evidence is now in hand that establishes a definite relationship between *U. nitidus* and the gorgonian coral *Chrysogorgia elegans* (Verrill, 1883) and a possible relationship of this chirostylid with another gorgonian *Acanella arbuscula* (Johnson, 1862).

At station 69-A-11-27 a large specimen of *Chrysogorgia elegans,* dredged in nearly perfect condition from 425-450 fathoms, was found to have a live *Uroptychus nitidus* clinging to its branches. The latter was an ovigerous female (14 mm carapace length) that was a nearly perfect color match (pale orange) with the gorgonian.

The sharp, curved, terminal spine on the dactyli of legs 2-4 and the slanted hairs on their propodi permit this species to cling tightly or move easily through the branches of the gorgonian. It is, however, extremely difficult to remove the crustacean from the gorgonian without damaging one or the other. The above referenced specimen is the only one found so intimately associated with the gorgonian. Nevertheless, all the remaining specimens in our collection were taken in conjunction with one of two species of gorgonian as follows:

65-A-9-15-Dredge #2, 330 fathoms, *Chrysogorgia* sp.

68-A-13-23, 400 fathoms, *Chrysogorgia elegans*

69-A-11-4, 550 fathoms, *Chrysogorgia elegans*

68-A-13-27, 600-640 fathoms, *Acanella arbuscula*

68-A-13-12A, 580-720 fathoms, *Acanella arbuscula*

It appears from the above that there may be a change of host with depth, but this is not yet established.

Typical Form

Previous Gulf of Mexico Records

Northeast Gulf: *Blake* station 44 (539 fms.) (Milne Edwards, 1880).

Southeast Gulf: *Atlantis* stations 2995 and 2996 (370-665 fms.), (Chace, 1942).

Alaminos Material

Five specimens from five stations in 400 to 640 fathoms as follows:

Northwest Gulf: 68-A-13-12A (580-720 fms.), 1 ♂; 68-A-13-23 (400 fms.), 1 ♂; 68-A-13-27 (600-640 fms.), 1 ovig. ♀; 69-A-11-4 (550 fms.), 1 ♂.

Southwest Gulf: 69-A-11-27 (425-450 fms.), 1 ovig.♀.

Remarks

Chace (1942) points out that the typical form of *U. nitidus* is larger than the other varieties (up to 13.1 mm carapace length and with ovigerous females from 9.5 to 13.0 mm carapace length). *Alaminos* specimens range in size from 5 to 14 mm carapace length. The two ovigerous females measure 9 and 14 mm and were taken in August and November. Chace also points out that the typical form is found deeper than the other varieties, i.e., usually below 400 fms.; and this is also true of the *Alaminos* specimens. The typical form is distributed in the Lesser Antilles, off the north coast of Cuba, and throughout the Gulf of Mexico from 400-734 fathoms, except for the record from *Blake* station 232 given as 88 fathoms.

Variety B

Previous Gulf of Mexico Records

None.

Table 5-1
Gulf of Mexico Species of Chirostylidae
Not Taken by ALAMINOS

Species	Area of Gulf	Collected by	Depth (fms.)	Reference
Eumunida picta Smith, 1883	SE	Atlantis 3302, 3303	230-260	Chace, 1942, p. 3
	NE	Oregon 1283	260	Springer & Bullis, 1956, p. 14
Gastroptychus affinis Chace, 1942	SE	Atlantis 3303, 3479 3482	190-260	Chace, 1942, p. 6
Gastroptychus spinifer (A. Milne Edwards, 1880)	SE	Atlantis 3303, 2999, 3467, 3479	145-260	Chace, 1942, p.5
	SE	Oregon 1328	200-300	Springer & Bullis, 1956, p. 14
Uroptychus brevis Benedict, 1902	SE	Atlantis 2995	370-605	Chace, 1942, p. 26
Uroptychus jamaicensis Benedict, 1902	SE	Atlantis 2995	370-605	Chace, 1942, p. 20
Uroptychus rugosus (A. Milne Edwards, 1880)	SE	Atlantis 3303	260	Chace, 1942, p. 28
Uroptychus spinosus (Milne Edwards and Bouvier, 1894)	SE	Atlantis 2999	145-230	Chace, 1942, p. 29
Uroptychus uncifer (A. Milne Edwards, 1880)	SE	Atlantis 2999, 3479	145-230	Chace, 1942, p. 18

Alaminos Material

Southeast Gulf: 65-A-9-15-Dredge #2 (330 fms.), 1 ovig. ♀.

Remarks

Chace (1942) remarks that Variety B is smaller than the typical form but larger than Variety A. Known specimens have a carapace length of up to 6.9 mm. The *Alaminos* specimen, an ovigerous female, measures 6 mm carapace length.

Distribution

Variety B is distributed off the north coast of eastern Cuba and in the SE Gulf of Mexico from 250-400 fms.

Family PORCELLANIDAE

This family is comprised primarily of species that live in shallow water. As a result, only one species, *Porcellana sigsbeiana*, is represented in the *Alaminos* collection from below 100 fathoms.

***Porcellana sigsbeiana* A. Milne Edwards, 1880**

Porcellana sigsbeiana A. Milne Edwards, 1880, p. 35. – Benedict, 1901, p. 137. – A. Milne Edwards & Bouvier, 1923, p. 292, pl. 1, fig. 6. – Schmitt, 1935, pp. 189, 190. – Chace, 1942, p. 102; 1956, p. 16. – Haig, 1956, p. 33. – Bullis and Thompson, 1965, p. 10.

Previous Gulf of Mexico Records

Northeast Gulf: *Blake* station 49 (118 fms.), (A. Milne Edwards, 1880), *Oregon* stations 27, 326, 332, 696, 325, (60-120 fms.), (Springer and Bullis, 1956).

Southeast Gulf: *Blake* station 36 (84 fms.).

Alaminos Material

Twenty-one specimens from five stations in 100-150 fathoms:

Northwest Gulf: 68-A-13-7 (150 fms.), 3 ♀.

Southwest Gulf: 69-A-11-60 (110 fms.), 2 ♂; 69-A-11-76 (100 fms.), 1 specimen.

Northeast Gulf: 68-A-7-8C (111 fms.), 1 ♀ ovig., 1 ♂, 1 juv.; 69-A-13-42 (100 fms.), 5 ♀ (4 ovig.), 7 ♂.

Remarks

Alaminos specimens range in length from 6 to 15 mm. Ovigerous females ranging from 11 to 15 mm carapace length were taken in August and October.

Distribution

P. sigsbeiana ranges off Martha's Vineyard to the Virgin Islands and throughout the Gulf of Mexico in 27 to 215 fathoms.

Discussion

Presently, 14 species of *Munida* and 23 species of *Munidopsis* are known to exist in the deeper waters of the Gulf of Mexico. During deep-water dredging operations, the *Alaminos* collected seven species of *Munida* and 14 species of *Munidopsis*. An important reason why we did not take higher percentages of the Gulf species in these genera is related to the restricted distribution of several species (see Table 5-2 and note the SE quadrant) and to the fact that up to now the *Alaminos* has made very few dredgings in the SE quadrant. This situation is clearly reflected in Table 5-3, where we observe that five of the seven species of *Munida* and seven of the eight species of *Munidopsis* not taken by the *Alaminos* occur in the Gulf only in the SE quadrant. Moreover, the remaining three species not represented in our collection are extremely rare (e.g., *Munidopsis barbarae*, of which only two specimens are known to exist). It is understandable, therefore, why all new Gulf records for *Munidopsis* reported in this study are for species that appear not to exist in the SE quadrnat of the Gulf (see lower part of Table 5-2).

This leads us to the observation that disproportionate numbers of species of *Munida* and *Munidopsis* exist in the SE Gulf, as compared with other quadrants. Chace (1942), as a matter of fact, was impressed by the larger number of Galatheoidea taken by *Atlantis* off the northern coast of Cuba (SE Gulf), as compared with the southern coast (in the Caribbean Sea). As far as the Gulf proper is concerned, 28 species of galatheids exist in the SE quadrant (Tables 5-2 and 5-3), as compared with 16 in the NW, 12 in the NE, and only 8 in the SW. An explanation for this uneven distribution is not available. It is noteworthy, nevertheless, that all of the *Munida* species of the Gulf occur in the SE quadrant, whereas scarcely more than half of the *Munidopsis* species occur there. We note further that as a group *Munida* tends to prefer shallow water, as compared with *Munidopsis* (Figure 5-1). It might appear that the shallow-water *Munida* group flourishes only in tropical waters where winter temperature minima are quite high, but in reality temperature appears to be of only ancillary importance, judging from the paucity of *Munida* in the warm SW Gulf. In view of this, we

Table 5-2
Deep Water Galatheoidea
Taken by ALAMINOS in Gulf of Mexico
Quadrant Dividing Lines: 90th Meridian, 25th Parallel

Species	Quadrant Where Found				First Gulf Record
	SE	NW	NE	SW	
Chirostylidae					
Uroptychus nitidus	+	+	+	+	A. Milne Edwards, 1880
Galatheidae					
Munida valida	+	+	+	+	Chace, 1956
longipes	+	+	+	+	Chace, 1942
forceps	+	+	+		A. Milne Edwards, 1880
microphthalma	+	+			" " "
flinti	+		+		Benedict, 1902
irrasa	+				A. Milne Edwards, 1880
sculpta	+				Benedict, 1902
Munidopsis					
sigsbei	+	+	+	+	A. Milne Edwards, 1880
robusta	+	+	+	+	Chace, 1956
longimanus	+	+	+		Chace, 1942
espinis	+	+			Benedict, 1902
erinacea	+	+			Chace, 1942
tridentata	+	+			" "
abbreviata	+	+			" "
polita		+			Pequegnat & Pequegnat, Herein
gulfensis		+			" " "
bermudezi		+			" " "
alaminos		+	+		" " "
simplex		+	+	+	" " "
nitida				+	" " "
spinoculata				+	" " "
geyeri				+	" " "
Porcellanidae					
Porcellana					
sigsbeiana	+	+	+	+	A. Milne Edwards, 1880

are inclined to believe that moderately deep carbonaceous regions with relatively high temperature regimes favor the development of *Munida* populations in the Gulf of Mexico.

The genus *Munidopsis* contains the deep-water component of the family Galatheidae. In the Gulf of Mexico there are three bathymetric groups: (1) those that have population centers between 200 and 500 fathoms, (2) those that exist primarily between 500 and 1,000 fathoms, and (3) a truly deep-water group found most frequently between 1,500 and 2,100 fathoms (Figure 5-1). The bulk of the shallow group is found in the SE Gulf, but the deeper groups are not. They appear to prefer gen-

erally the western half of the Gulf and the SW quadrant in particular.

Bathymetric ranges of most species of galatheids in the Gulf of Mexico are quite narrow, but this is not as evident from Figure 5-1 as it is from Table 5-4. In Figure 5-1 the depth data have been derived from all geographic subdivisions of the Gulf, whereas in Table 5-4 the depths are derived from only two cruises that sampled a north-south transect of the western Gulf from Texas to Mexico. All dredging stations at which galatheids were taken in cruises 68-A-13 and 69-A-11 are included as well as a few where they were not taken. Thus each horizontal line represents one dredging station. The Benthic Skimmer was the only collecting device used. A few dredgings at 2,000 and 2,100 fathoms are not included (no galatheids were taken); otherwise, all are presented. In each dredging, attempts were made to contour along an isobath, but steep and often irregular slopes foiled these efforts about one out of every three lowerings. Nevertheless, a careful perusal of this table demonstrates the narrowness of the bathymetric range of most species when data are derived from a single transect. In general, all 68-A-13 stations were confined to the NW quadrant, whereas on 69-A-11, stations 1 to 17 were NW; and 21 to 93 were in the SW quadrant with stations 26 to 59 farthest south (18° to 19° N latitude).

Individuals listed for each species (vertical colums) in Table 5-4 are not translatable into population density, nor are they of comparative signifi-

Table 5-3
Deep Water Galatheoidea
Not Taken by ALAMINOS in Gulf of Mexico
Quadrant Dividing Lines: 90th Meridian, 25th Parallel

Species	Quadrant Where Found SE	NW	NE	SW	First Gulf Record
Galatheidae					
Munida					
evermanni	+				Benedict, 1901
iris	+				Chace, 1956
miles	+		+		A. Milne Edwards, 1880
nuda	+		+		Benedict, 1902
schroederi	+				Chace, 1939
stimpsoni	+				A. Milne Edwards, 1880
striata	+				Chace, 1942
Munidopsis					
armata	+				Chace, 1942
barbarae			+		" "
brevimanus	+				" "
espinis	+				" "
expansa	+				" "
latifrons	+				" "
serratifrons	+				Benedict, 1902
spinifer	+				Chace, 1942
tridens	+				" "

Table 5-4
Depth of Capture and Number of Individuals of Galatheoidea from Two Cruises of ALAMINOS in Western Gulf of Mexico 68-A-13 and 69-A-11

Depth (fms)	Munida			Munidopsis												Porcellana	Uroptychus
	longipes	microphthalma	valida	robusta	alaminos	polita	erinacea	longimanus	sigsbei	abbreviata	spinocultata	simplex	nitida	gulfensis	geyeri	bermudezi	sigsbeiana	nitidus
100																		
100																	1	
110																	2	
150	1																	
150	5																3	
155	1																	
185-205	2																	
185-210	4																	
210	2																	
255	1	1																
260		2		1														
260	1	2																
250-450		3		1														
280		3		1	1	1	1											
280-350		10					3	1										
360-470		3				1	1		1									
400								1										
400		10																1
425-450								1	1									1
480																		
480								1	1									
515									1									
530									1									
550									1									1
530-590									2									
580-720									7									1
580-750									2									
600-640										1	1							1
650-750												1						
725												6						
750											2	2	1					
710-760												1						
765									1			3		1				
750-785									22			2						
800			1						10									
970													4					
1,160													1		1			
1,600-1,640																		
1,800																1		
1,840																		
1,840-1,910																		

cance because no details are given as to the area covered by the dredge. It is noteworthy, however, that the number of stations at which we obtained a single specimen of a species is unusually high, as compared with our records for other kinds of invertebrates. This situation appears to apply more directly to *Munidopsis* than to *Munida.* For instance, each time a *Munidopsis* species was represented in a haul by one individual and a *Munida* was taken, the latter was represented by more than one individual. This suggests to us, other things being considered, that *Munidopsis* species are better able to escape the skimmer than are *Munida* species. Because we see no obvious morphological reason why the former could avoid the dredge better than the latter (actually, the advantage seems to be the other way, considering the better developed eyes of *Munida*), we believe that many of the *Munidopsis* species live in burrows and that at least *Munida longipes* and *M. valida* do not. We have little additional evidence to support this view other than a bottom photograph taken by *Alaminos,* showing a *Munidopsis* emerging from a small burrow. The skimmer would ordinarily not take a galatheid from a burrow, except when it cut into an irregular bottom.

It is possible, of course, that the greater numbers of *Munida* in a single haul could indicate that at least these species of that genus are more gregarious than are those of *Munidopsis.* Some bottom photographic evidence could be interpreted to support this view.

An analysis of population densities of Galatheoidea in the Gulf of Mexico in relation to other invertebrates will be presented in a later paper now in preparation.

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Alphabetical Catalogue of Species

Alphabetical Catalogue of Species *(Con't.)*

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