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DISTRIBUTION OF MYODOCOPID OSTRACODS IN TAMPA BAY, FLORIDA, AND ASSOCIATION WITH ABIOTIC VARIABLES

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ABSTRACT Myodocopid ostracods were identified from > 600 benthic samples collected from Tampa Bay, Florida, during 1995 to 2001, as part of an annual synoptic survey of the benthos. At least 24 taxa were present. *Parasterope pollex* was the most abundant (76%) and most frequently collected (48%) species; *Rutiderma darbyi* (28%) and *Eusarsiella disparalis* (16%) were the next most frequently collected species. Logistic regression and "center of abundance" calculations were used to identify habitat "preferences" for the most frequently occurring species. With the exception of *P. pollex*, these were more likely to occur in coarser sediments, in more saline waters, and at greater depths than the mean for Tampa Bay. *Parasterope pollex* occurred over the widest ranges of salinity and sediment types, although it preferred medium to fine sand-sized sediments; *P. pollex* was also the species most tolerant of low dissolved oxygen concentrations.

INTRODUCTION

Myodocopid ostracods are common inhabitants of estuarine and marine sediments, although species-specific quantitative ecological information is often lacking. The different families of myodocopids appear to serve different roles in energy transfer. Filter feeding is believed to be typical of the Cylindroleberidae, detritivory of the Philomedidae; the Cypridinidae include scavengers, and both the Sarsiellidae and Rutidermatidae appear to be predators (Cannon 1933, Kornicker 1975, Vannier et al. 1998). Many species are capable of migrating into the water column (Schram 1986, Alldredge and King 1985), where they may serve as prey for zooplankton (Vannier et al. 1998) and fish (Hobson and Chess 1976).

At least 34 species of myodocopid ostracods have been identified as occurring in shallow, near-shore waters of peninsular Florida, including the Gulf of Mexico (GOM) (Kornicker 1977, 1983, 1984a, 1984b, 1986a, 1986b, Kornicker and Iliffe 1989, Horsley 1990, Grabe et al. 1995, Kornicker and Grabe 2000). With the exception of work done in southwest Florida (Grabe et al. 1995), these papers primarily address the taxonomy of myodocopids. Ecological information on myodocopids is often ancillary to the species descriptions.

This study examines the spatial distribution and taxonomic composition of myodocopid ostracods in Tampa Bay, Florida, one of the largest estuaries in Florida (> 1,000 km^2 ; Clark and Macauley 1989). Habitat preferences are quantified for the more frequently occurring species. Representative specimens from these collections are deposited in the US National Museum.

MATERIALS AND METHODS

The study employed a stratified (by 7 bay segments) probabilistic design (Larsen et al. 1994; Coastal Environmental, Inc. 1994). Hexagonal grids were randomly superimposed over the Tampa Bay estuarine system. Within each hexagon, the sampling location was randomly determined, with a known probability of inclusion. Bay segments included Boca Ciega Bay, Hillsborough Bay, Lower Tampa Bay, the Manatee River, Middle Tampa Bay, Old Tampa Bay, and Terra Ceia Bay (Figure 1). Although the program commenced in 1993 and continues to the present, ostracods were analyzed only from 610 samples collected during 1995 to 2001 (Figure 1). All sampling occurred during late July–early October.

Benthic infauna, hydrographic profiles, and sediments were collected using the standard EMAP techniques adopted by USEPA for the Louisianan Province (Holland 1990). At each station, the water column profile for temperature (°C), dissolved oxygen (DO; mg/l), and salinity (psu) was measured with a Hydrolab Surveyor 3.

Sediment samples were collected with a 0.04 m^2 Young sampler. A core was removed from each sample and stored, on ice, for subsequent characterization of the sediment. Benthic samples were stored, on ice, after adding a solution of magnesium sulfate to relax the organisms. Samples were later sieved (0.5 mm mesh) and then fixed in a 10% solution of borax-buffered formalin and Rose Bengal.

Ostracods were not a taxon of interest to the bay-wide benthic monitoring program. However, the myodocopid ostracods were removed from most of the samples collected during 1995 to 2001 and identified to the lowest practical taxonomic level.

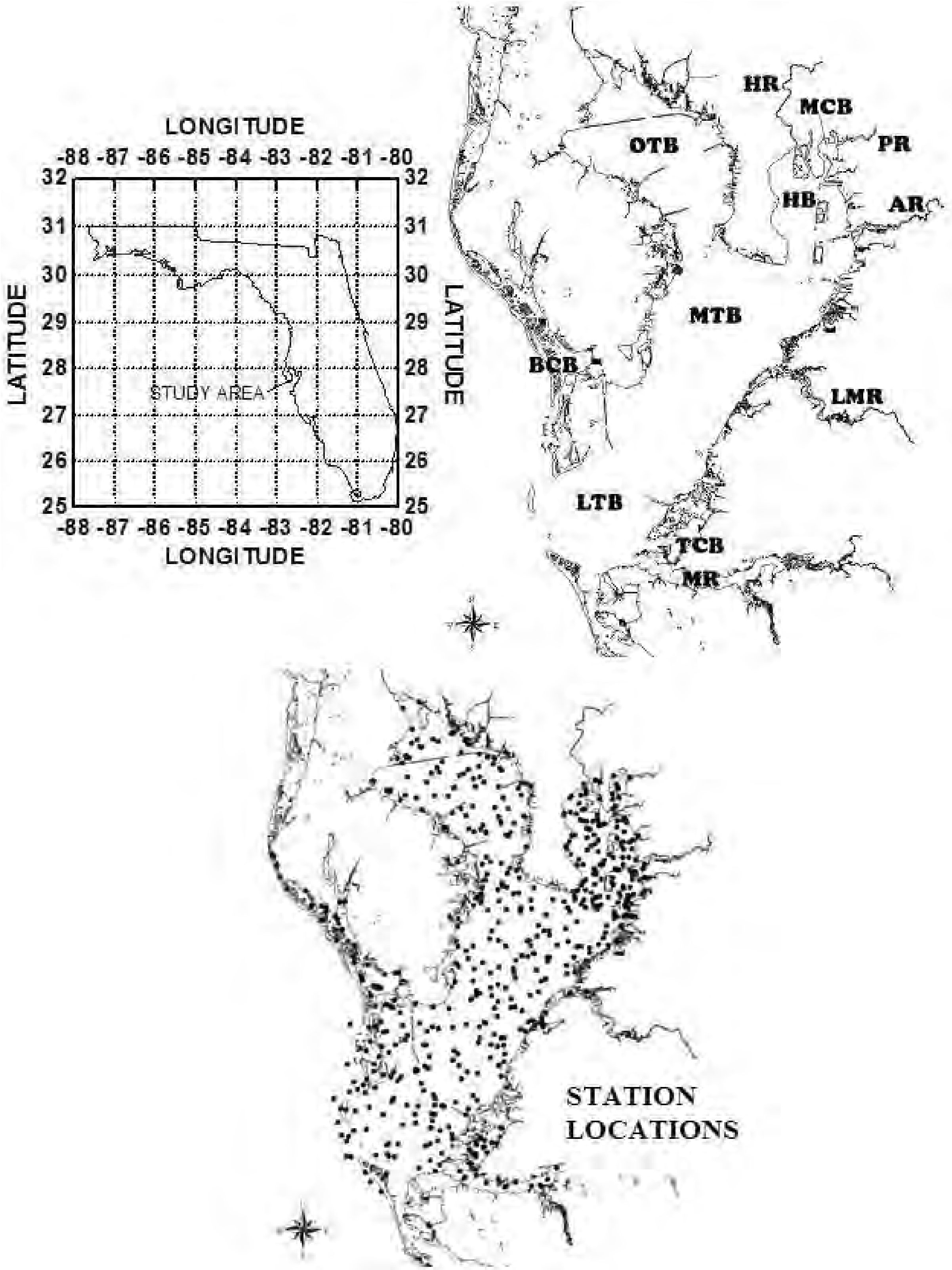

Figure 1. Location of sampling stations for myodocopid ostracods in Tampa Bay, Florida, 1995-2001. Bay segments are BCB (Boca Ciega Bay), HB (Hillsborough Bay), LTB (Lower Tampa Bay), MR (Manatee River), MTB (Middle Tampa Bay), OTB (Old Tampa Bay), and TCB (Terra Ceia Bay). Subareas are AR (Alafia River), HR (Hillsborough River), LMR (Little Manatee River), MCB (McKay Bay), and PR (Palm River).

TABLE 1

Mean, median, and range of selected abiotic variables by relative depth, from Tampa Bay, Florida 1995–2001.

Variable	Mean	Median	Range
Depth (m)	2.8	2.5	0.1–13.2
Silt+Clay (%)	8.4	4.4	0.1–91.8
Temperature-Surface (°C)	28.9	29.0	21.6–39.2
Temperature-Bottom (°C)	28.7	28.7	21.6–39.2
Salinity-Surface (psu)	25.2	26.1	2.4–35.9
Salinity-Bottom (psu)	26.1	26.9	4.3–36.0
Dissolved Oxygen-Surface (mg/l)	6.2	6.1	1.1–13.2
Dissolved Oxygen-Bottom (mg/l)	5.2	5.4	0.2–14.0

Sediments were analyzed to determine the percentage of silt+clay (%SC) particles < 63 µm diameter. An aliquot of sediment was wet sieved through a 63 µm mesh sieve and dried to a constant weight (Strobel et al. 1995).

Data collected by Long et al. (1994) from Tampa Bay were used to estimate a relationship between %SC and mean grain (ϕ) using TableCurve 2D (SYSTAT 2002):

$$\%SC = 1/(0.0097 + 1.575 \quad e^{\phi}); \text{ (adjusted } r^2 = 0.947)$$

ϕ was then estimated for each %SC value from the 1993-2001 samples. Sediments were then categorized (e.g., medium sand, mud) according to the Wentworth scale breakpoints for ϕ (cf. Percival and Lindsay 1997).

The percent similarity of species associations were examined using the Sorensen coefficient for presence-absence (Clarke and Warwick 2001). Logistic regression was used to characterize habitat preferences for the 10 most frequently occurring species (cf. Huisman et al. 1993, Peeters and Gardiniers 1998, Ysebaert et al. 2002). Forward stepwise multiple logistic regression (SPSS, Inc. 2000) was used to identify abiotic variables best able to predict the occurrence of the 10 species. Log_{10} $(n + 1)$ transformed abiotic variables used in this analysis include depth (m), salinity, temperature, DO, and %SC (arc sine (ASN)). TableCurve 2D (SYSTAT 2002) was used to develop univariate Gaussian logistic regression equations so that the “optimum” value and the “tolerance” (preferred range) could be calculated (Peeters and Gardiniers 1998). McFaddens’s Rho^2 was used as a measure of goodness-of-fit (McFadden 1974, Hensher and Johnson, 1981). Values are similar to, but generally lower than, the coefficient of determination. Hensher and Johnson (1981) suggest that values between 0.2 and 0.4 represent a good fit.

Results of these analyses should be treated cautiously as the sample sizes are small relative to those used by Peeters and Gardiniers (1998) and Ysebaert et al. (2002).

Center of abundance calculations were also made: Σ(species abundance abiotic variable)/Σ species abundance.

RESULTS AND DISCUSSION

Study area

Sample depths during the study ranged from 0.1 to 13.2 m, although the median depth was 2.5 m (Table 1). Near-bottom salinities in Tampa Bay during the summer-fall period are typically in the polyhaline (18–30 psu) range (Table 1). Sediment types in Tampa Bay included coarse sands (including shell hash; < 1.7 %SC), medium sands (1.7 < 4.51 %SC), fine sands (4.51 < 11.35 %SC), very-fine sands (> 11.35 < 25.95 %SC), and mud-sized sediments (> 25.95 %SC). Tampa Bay sediments are predominantly medium to fine sand-sized sediment, although mud-sized sediments are located in tributaries and portions of Hillsborough Bay (Figure 2). Near-bottom DO concentrations in the bay are generally above 4 mg/l, although mesohaline and polyhaline very fine sand and mud habitats were often hypoxic.

Overview of the mydocopid assemblage

At least 20 species of myodocopids have been identified to date from Tampa Bay. The 2 most abundant and frequently occurring species were *Parasterope pollex* and *Rutiderma darbyi* (Table 2). Most taxa occurred in < 1% of the samples and represented < 0.1% of the individuals collected. The Sorensen coefficient showed that *P. pollex* and *Eusarsiella disparalis* were most similar in their co-occurrence (coefficient = 36), followed by *E. texana*–*Asteropterygion oculitristis* (32) and *E. texana*–*P. pollex* (31).

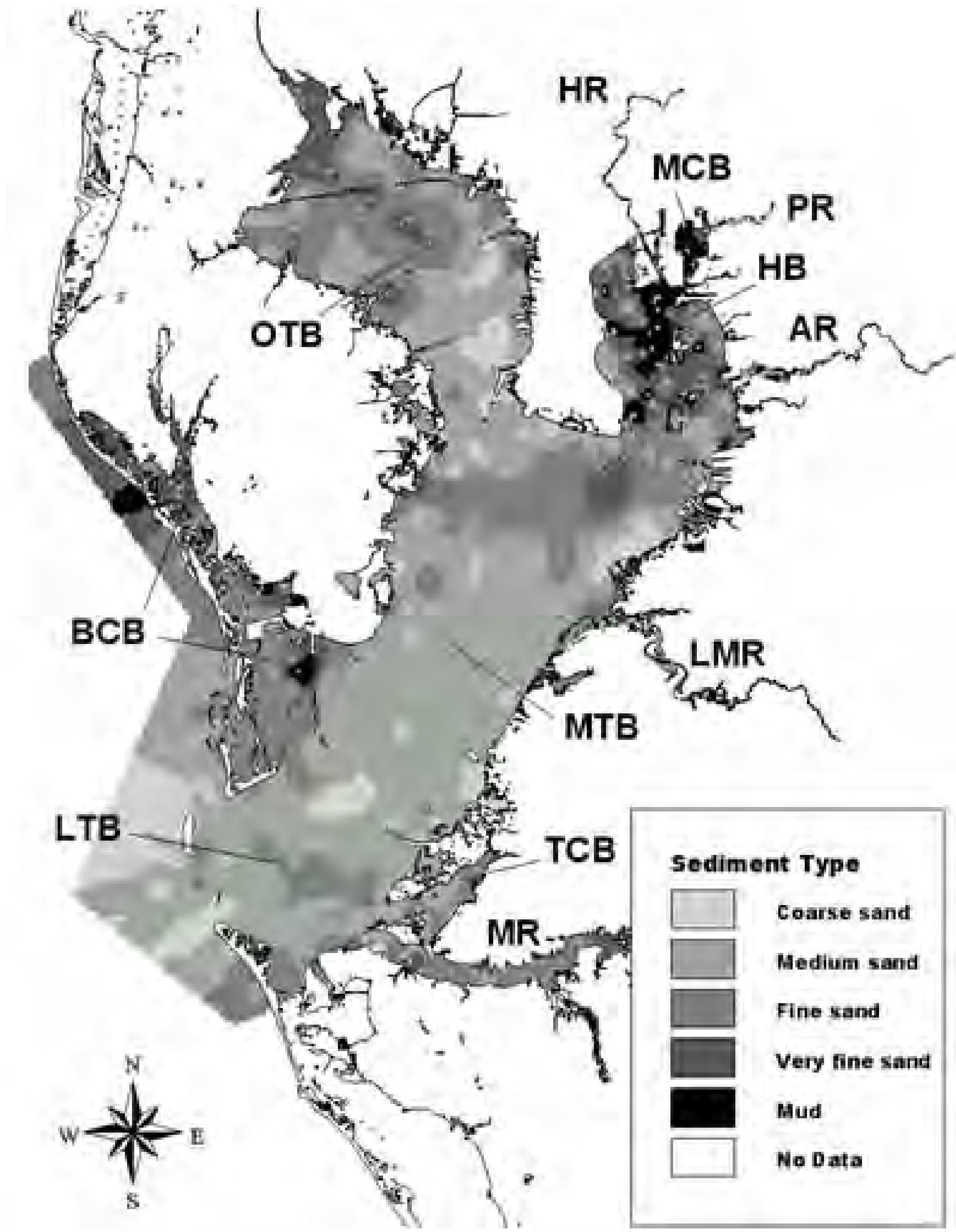

Figure 2. Map depicting the distribution of sediment types in Tampa Bay, Florida. Site codes are found in Figure 1 legend.

Selected taxa

Cylindroleberidae. *Amboleberis americana* has been reported in the Atlantic Ocean from North Carolina to Brazil as well as in the Caribbean and the GOM; it has also been reported from the Pacific coast of central America (Kornicker 1986b). In Tampa Bay, this species was most often found from the central bay to the GOM, generally proximal to the main shipping channel (Figure 3). Logistic regression showed that the probability of occurrence increased with salinity and depth and decreased as %SC increased (Table 3). This species preferred the greatest depths of the 10 species (Table 4). It was also collected over the narrowest range of salinities (Table 4). The optimal sediment type appeared to be coarse sand (%SC < 1.7). A single ovigerous specimen was found with 21 eggs (Table 5); Horsley (1990) reported a maximum of 37 eggs.

Asteropterygion oculitristis has been found off coastal Georgia (Darby 1965) and is reported to range to Texas in

TABLE 2

Taxonomic inventory, frequency of occurrence (%FO), percent composition (%COMP), and mean numbers m^{-2} (standard error ($s_{\bar{x}}$), ±1) of myodocopid ostracods collected from Tampa Bay, Florida, 1995–2001 (*n* = 610).

	% FO	% COMP	Mean ($s_{\bar{x}}$, ±1) # m^{-2}
Cylindroleberidae			
Amboleberis americana (Müller 1890)	4.1	0.1	2.2 (0.6)
Asteropella sp.	0.2	<0.1	<0.1 <0.1)
Asteropella maclaughlinae Kornicker 1981	1.0	<0.1	<0.3 (0.1)
Asteropterygion oculitristis (Darby 1965)	12.1	0.3	6.0 (0.9)
Parasterope pollex Kornicker 1967	48.2	76.4	1,621.0 (230.2)
Prionotoleberis salmoni Kornicker 1986	0.5	<0.1	0.2 (0.1)
Philomedidae			
Harbansus paucichelatus (Kornicker 1958)	4.6	0.2	3.9 (1.3)
Pseudophilomedes ambon Kornicker 1984	0.2	<0.1	<0.1 (<0.1)
Pseudophilomedes darbyi Kornicker 1989	6.2	0.2	4.5 (1.0)
Rutidermatidae			
Rutiderma darbyi Kornicker 1983	28.4	19.8	420.1 (50.3)
Rutiderma mollitum Darby 1965	1.8	0.6	12.2 (6.6)
Sarsiellidae			
Eusarsiella sp.	1.8	<0.1	0.7 (0.3)
Eusarsiella childi Kornicker 1986	8.4	0.7	15.7 (6.8)
Eusarsiella cresseyi Kornicker 1986	1.6	<0.1	0.5 (0.2)
Eusarsiella disparalis (Darby 1965)	15.7	0.6	12.2 (2.5)
Eusarsiella elofsoni Kornicker 1986	0.5	<0.1	0.1 (0.1)
Eusarsiella ozotothrix (Kornicker and Bowen 1976)	0.3	<0.1	0.2 (0.2)
Eusarsiella radiicosta (Darby 1965)	0.8	<0.1	0.5 (0.3)
Eusarsiella spinosa (Kornicker and Wise 1962)	3.4	0.1	1.3 (0.3)
Eusarsiella tampa Kornicker and Grabe 2000	2.0	0.1	1.4 (0.5)
Eusarsiella texana (Kornicker and Wise 1962)	11.8	0.8	17.4 (7.7)
Eusarsiella zostericola (Cushman 1906)	1.5	<0.1	1.0 (0.5)
Family/genera undetermined	0.8	<0.1	0.2 (0.1)
Mean density (Total myodocopid ostracods)			2,121.9 (235.6)

the GOM (Kornicker 1986b). In Tampa Bay it was primarily found in Middle and Lower Tampa bays (Figure 3). Logistic regression showed that probability of occurrence increased with depth and DO and decreased as %SC increased (Table 3). The optimum habitat appeared to be salinities > 25 psu and sediments of coarse to fine sands (< 8 %SC) (Table 4). In coastal SW Florida, *A. oculitristis* abundance was positively associated with %SC (where %SC ranged up to about 25%) and was negatively associated with the sorting coefficient (Grabe et al. 1995). Brood sizes ranged from 11 to 18 (Table 5).

Parasterope pollex has been reported from bays and estuaries from Nova Scotia, Canada, south to the Chesapeake Bay and along the Gulf coast of Florida to depths of about 13 m (Kornicker 1986b, Grabe et al. 1995). *Parasterope pollex* was the most widespread myodocopid in Tampa Bay (Figure 3) and it was the only species commonly collected in the upper portions of the bay. Baywide, *P. pollex* was collected in almost half of the samples, and it was present in 69% of the Old Tampa Bay samples. Densities ranged to 67,350 m^{-2} in Hillsborough Bay and averaged > 3,000 m^{-2} in Old Tampa Bay, 2,500 m^{-2} in Hillsborough Bay and 1,600 m^{-2} bay-wide. This frequency of occurrence and the mean densities are lower than those reported by Hulings (1969) for a bay in Massachusetts. *Parasterope pollex* was found in 90% of his samples from Hadley Harbor (near Martha's Vineyard), and seasonal means for adults ranged from 2,360–,440 m^{-2}.

This species was collected in Tampa Bay over the widest ranges of salinity and %SC (Table 3). Grabe et al. (1995) found that *P. pollex* abundance in SW Florida was

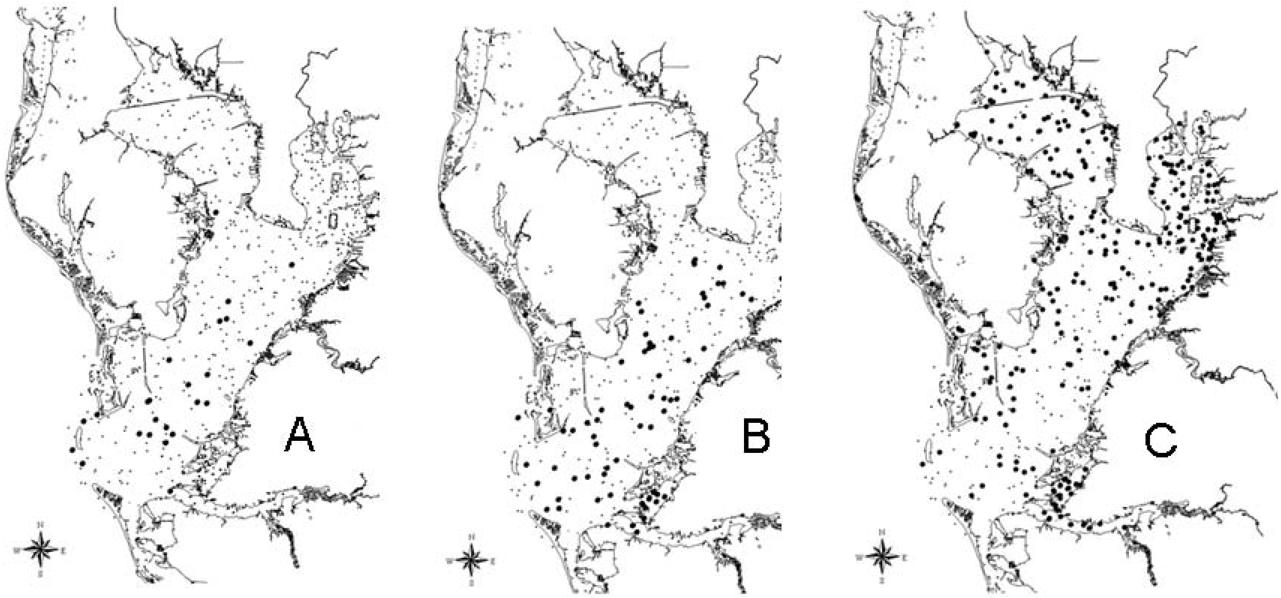

Figure 3. Distribution of A) *Amboleberis americana*, B) *Asteropterygion oculitristis*, and C) *Parasterope pollex* in Tampa Bay, Florida, 1995–2001.

associated with fine sand-sized sediments; in this study the optimal sediments were the medium to fine sand-sized sediments that predominate in Tampa Bay (Table 4). *Parasterope pollex* was also the species most tolerant of low DO concentrations (Table 4). Logistic regression showed that depth, DO and %SC were the most important variables explaining the occurrence of *P. pollex* (Table 3). Brood sizes ranged from 4–12 (Table 5). Horsley (1990) summarized data from several studies and estimated that the maximum number of eggs for the largest (1.44 mm CL) female would only be seven.

Philomedidae. *Harbansus paucichelatus* is reported to occur from North Carolina into the GOM and to Belize in the Caribbean Sea (Kornicker 1984a). In Tampa Bay, *H. paucichelatus* was found in the middle to lower portions of the bay, including Terra Ceia Bay (Figure 4). Logistic regression showed that salinity and %SC were key variables affecting its occurrence (Table 3). This species preferred coarse to fine sand-sized sediments and polyhaline salinities (Table 4). Horsley (1990) collected this species most often from medium and fine sand-sized sediments. Brood sizes ranged from 3–6 (Table 5).

Pseudophilomedes darbyi has been reported from North Carolina south into the GOM as far west as Texas (Kornicker and Iliffe 1989). In Tampa Bay, *P. darbyi* was found mainly in Middle and Lower Tampa Bay but did penetrate into Old Tampa Bay (Figure 4). Logistic regression showed this species' presence to be positively associated with salinity and depth and negatively associated with %SC (Table 3). *Pseudophilomedes darbyi* preferred the second deepest waters of the 10 species; it prefers the narrowest range of salinities and coarse to medium sands (Table 4). Brood sizes ranged from 3–7 with a median of 4 (Table 5).

Rutidermatidae. *Rutiderma darbyi* occurs from North Carolina to south Florida and the Bahamas and into the GOM (Kornicker 1983). It was widespread throughout Middle and Lower Tampa Bay and penetrated midway into both Old Tampa Bay and southern Hillsborough Bay (Figure 4). Logistic regression showed an association with depth, salinity and %SC (Table 3). Although a Gaussian response curve could not be fitted for %SC, the probability of occurrence was 0.7 at 0 %SC (coarse sands) and approached 0 at 15 %SC (very fine sands). Horsley (1990) found *R. darbyi* to be more common in medium and fine sands. Brood sizes were small and ranged from 2–6 eggs (Table 5). Kornicker (1986b) reported that the Rutidermatidae generally brood 3–4 eggs regardless of size.

Sarsiellidae. *Eusarsiella childi* was described by Kornicker (1986a) from specimens collected in SW Florida and has been reported from the GOM at depths to 12.8 m. Although *E. childi* was most frequently found in the lower bay, it did penetrate into Old Tampa Bay and Hillsborough Bay; there was also a single occurrence in upper Boca Ciega Bay (Figure 5). Logistic regression showed that %SC and salinity were the key abiotic variables (Table 3). *Eusarsiella childi* appeared to inhabit the narrowest range of sediment types, preferring coarse sands (Table 4). This contrasts with observations off Marco

TABLE 3

Summary of forward stepwise logistic regression analyses for the association between selected abiotic variables and the 10 most frequently occurring myodocopid ostracod species.

	McFadden's Rho^2	Constant	L_{10} Temperature	L_{10} Salinity	L_{10} Depth	L_{10} DO	ASN%SC
Cylindroleberidae							
Amboleberis americana	0.23						
Coefficient		−25.4	NS	14.8	2.9	NS	−31.6
Odds Ratio				>2 x 10^6	19		0
Asteropterygion oculitristis	0.11						
Coefficient		−5.9	NS	NS	2.8	3.4	−7.1
Odds Ratio					16	27	<1
Parasterope pollex	0.02						
Coefficient		−1.0	NS	NS	NS	1.4	−1.4
Odds Ratio						4	<1
Philomedidae							
Harbansus paucichelatus	0.12						
Coefficient		−15.2	NS	9.2	NS	NS	−28.0
Odds Ratio				9,793			0
Pseudophilomedes darbyi	0.24						
Coefficient		−7.5	NS	4.3	–3.1	NS	−25.7
Odds Ratio				1,039	21		0
Rutidermatidae							
Rutiderma darbyi	0.24						
Coefficient		−7.5	NS	4.3	3.1	NS	−25.7
Odds Ratio				1,039	21		0
Sarsiellidae							
Eusarsiella childi	0.16						
Coefficient		−11.5	NS	7.4	NS	NS	−39.3
Odds Ratio				1,643			0
Eusarsiella disparalis	0.02						
Coefficient		−1.3	NS	NS	NS	NS	−5.2
Odds Ratio							<0.1
Eusarsiella spinosa	0.09						
Coefficient		34.3	−26.6	NS	2.4	NS	NS
Odds Ratio			0		10		
Eusarsiella texana	0.04						
Coefficient		3.8	−8.2	3.1	NS	2.1	NS
Odds Ratio			0	22		8	

Island in SW Florida where *E. childi* abundance was positively associated with %SC (where % SC ranged up to about 25%) (Grabe et al. 1995). *Eusarsiella childi* also tended to occur at shallower depths than many of the other species. Brood sizes ranged from 3–14 (Table 5). Horsley (1990) reported a range of 1–10 eggs in 5 specimens.

Eusarsiella disparalis was described from coastal Georgia (Darby 1965) and ranges from North Carolina to just north of Tampa Bay (Kornicker 1986a). *Eusarsiella disparalis* is widespread in Tampa Bay, ranging from the mouth of the bay to the mouths of the Hillsborough and Alafia rivers in Hillsborough Bay (Figure 5). Logistic regression showed that %SC was the most important abiotic variable affecting its presence or absence in Tampa Bay (Table 3). A preferred salinity regime could not be defined using logistic regression. *Eusarsiella disparalis* was collected over the second widest salinity range after *P. pollex*, and was the species that most often co-occurred

TABLE 4

Summary of habitat characteristics for the 10 most frequently occurring myodocopid ostracods in Tampa Bay, Florida, 1995-2001. COA = center of abundance (R = range); OPT = optimum (TOL = tolerance). NR = Gaussian logistic regression equation could not resolve either an "optimum" or a "tolerance" range.

	SALINITY (psu)	%SC	DEPTH (m)	DO (mg/l)
Cylindroleberidae				
Amboleberis americana	COA(R): 28.9 (25.3-33.9)	COA(R): 2.8 (0.1-13.2)	COA(R): 4.1 (0.1-12.5)	COA(R): 5.5 (4.3-6.9)
	OPT(TOL): 32.0 (27.6-36.4)	OPT(TOL):0 (0-1.4)	OPT(TOL): 12.1 (7.0-17.2)	OPT(TOL): 5.5 (4.5-6.5)
Asteropterygion oculitristis	COA(R): 28.0 (10.8-35.0)	COA(R): 4.1 (0.1-17.1)	COA(R): 3.9 (0.1-9.0)	COA(R): 5.6 (4.4-8.9)
	OPT(TOL): 30.3 (26.2-34.7)	OPT(TOL): 3.3 (0.0-9.3)	OPT(TOL): 7.5 (4.5-10.5)	OPT(TOL): 5.7 (4.9-6.5)
Parasterope pollex	COA(R): 25.6 (4.3-35.8)	COA(R): 4.3 (0.8-91.8)	COA(R): 2.2 (0.1-11.0)	COA(R): 5.4 (0.2-11.3)
	OPT(TOL): 23.6 (17.5-29.7)	OPT(TOL): 7.1 (2.3-12.0)	OPT(TOL): 3.4 (0.7-6.0)	OPT(TOL): 6.3 (2.7-9.9)
Philomedidae				
Harbansus paucichelatus	COA(R): 29.0 (20.2-34.5)	COA(R): 3.6 (0.1-6.1)	COA(R): 3.2 (0.1-8.5)	COA(R): 6.2 (4.5-8.9)
	OPT(TOL): 29.8 (17.5-29.7)	OPT(TOL): 3.3 (1.0-5.6)	OPT(TOL): 6.7 (3.2-10.2)	OPT(TOL): 5.6 (5.0-6.2)
Pseudophilomedes darbyi	COA(R): 28.6 (18.0-34.0)	COA(R): 3.6 (0.1-21.4)	COA(R): 5.7 (0.1-12.2)	COA(R): 5.7 (3.4-7.0)
	OPT(TOL): 32.6 (32.2-33.0)	OPT(TOL): 3.6 (2.4-4.8)	OPT(TOL): 9.2 (8.5-9.9)	OPT(TOL): 5.8 (5.0-6.6)
Rutidermatidae				
Rutiderma darbyi	COA(R): 27.3 (8.2-34.7)	COA(R): 2.9 (0.1-49.6)	COA(R): 4.5 (0.1-12.2)	COA(R): 5.7 (2.5-9.2)
	OPT(TOL): 29.2 (24.3-34.0)	OPT(TOL): NR	OPT(TOL): 8.3 (5.0-11.6)	OPT(TOL): 5.9 (4.8-7.0)
Sarsiellidae				
Eusarsiella childi	COA(R): 27.4 (17.6-34.7)	COA(R): 2.2 (0.8-6.4)	COA(R): 2.4 (0.1-8.5)	COA(R): 6.6 (3.4-9.2)
	OPT(TOL): NR	OPT(TOL): 0.0 (0.0-1.2)	OPT(TOL): 2.9 (1.3-4.5)	OPT(TOL): 7.1 (5.3-8.9)
Eusarsiella disparalis	COA(R): 25.3 (7.9-36.0)	COA(R): 5.0 (1.4-23.1	COA(R): 2.1 (0.1-6.5)	COA(R): 5.1 (0.3-9.2)
	OPT(TOL): NR	OPT(TOL): 5.0 (3.0-7.0)	OPT(TOL): 2.4 (0.3-4.5)	OPT(TOL): 6.3 (2.8-9.8)
Eusarsiella spinosa	COA(R): 28.3 (10.8-33.9)	COA(R): 4.2 (0.2-17.1)	COA(R): 4.3 (0.1-9.0)	COA(R): 5.5 (4.1-7.3)
	OPT(TOL): 31.9 (27.9-35.9)	OPT(TOL): 0.0 (0.0-3.9)	OPT(TOL): 9.0 (4.8-13.2)	OPT(TOL): 6.6 (5.7-7.5)
Eusarsiella texana	COA(R): 26.2 (10.8-35.9)	COA(R): 4.2 (0.2-91.8)	COA(R): 2.4 (0.1-9.1)	COA(R): 6.3 (1.6-9.2)
	OPT(TOL): NR	OPT(TOL): 5.7 (3.4-8.0)	OPT(TOL): 3.7 (1.2-6.2)	OPT(TOL): 7.2 (5.1-9.3)

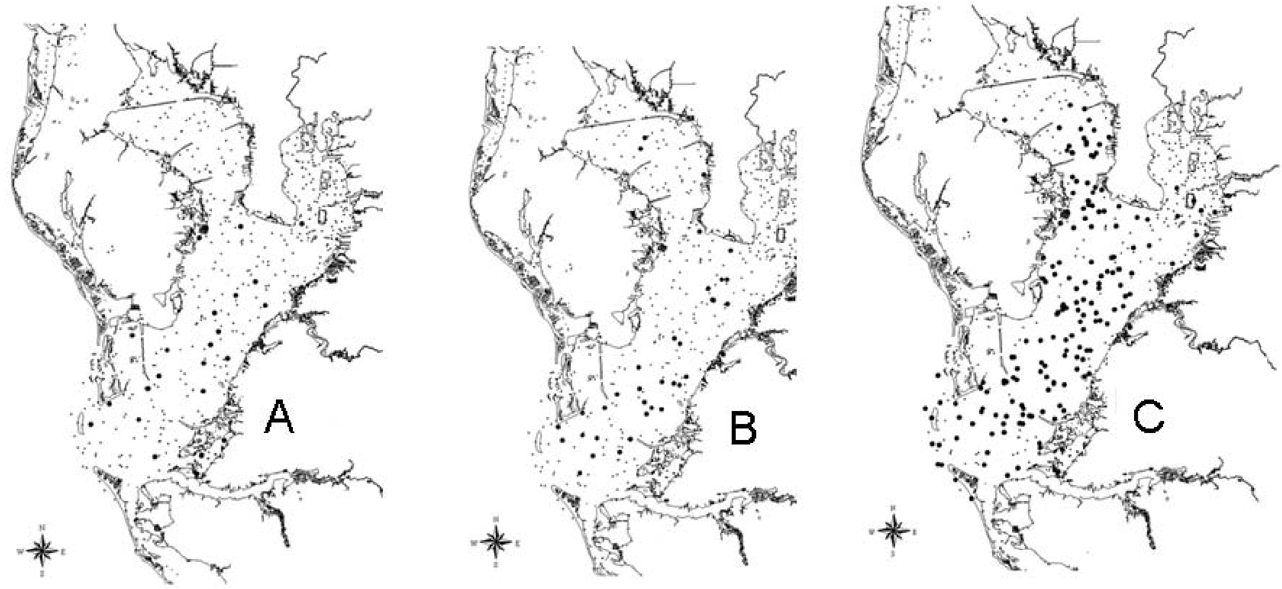

Figure 4. Distribution of A) *Harbansus pauchichelatus*, B) *Pseudophilomedes darbyi*, and C) *Rutiderma darbyi* in Tampa Bay, Florida, 1995–2001.

with *P. pollex*. Both *E. disparalis* and *P. pollex* were also the species most tolerant of subnominal (< 4 mg/l) DO (Table 4). The preferred habitat was shallow waters with medium to fine sands (Table 4). In coastal SW Florida *E. disparalis* abundance was positively associated with %SC (where % SC ranged up to about 25%) (Grabe et al. 1995).

Brood sizes ranged from 4–11 (Table 5). Horsley (1990) reported a maximum of 13 in the literature and a range of 1 to 10 in his samples.

Eusarsiella spinosa is known to occur from North Carolina to the Indian River on Florida's east coast and in the GOM from Marco Island to Texas (Kornicker 1986a, Grabe et al. 1995). This species was found primarily in the middle and lower portions of Tampa Bay, including Boca Ciega Bay, and Terra Ceia Bay, and was one of only 4 species found in the Manatee River; there was a single occurrence in Hillsborough Bay (Figure 5). Logistic regression showed only a weak association with temperature and depth (Table 3). This species preferred deeper waters and coarse to medium sand-sized sediments (Table 4). Brood sizes were among the smallest of the sarsiellids (Table 5).

Eusarsiella texana was described from the Texas Gulf coast (Kornicker and Wise 1962) and has been reported to range to Maryland (Kornicker 1986a). *Eusarsiella texana* is found throughout Tampa Bay, although it did not penetrate deeply into either Hillsborough Bay or the Manatee River (Figure 5). Logistic regression showed that key abiotic variables were salinity, DO, and temperature (Table 3). This species occurred over a wide range of both salinities and sediment types (Table 4). In coastal SW Florida *E. texana* was most abundant in well-sorted sands and at %SC up to > 25% (the maximum reported in the study, Grabe et al. 1995).

Brood sizes ranged from 2–13 (Table 5) whereas Horsley (1990) reported a maximum brood of 8 eggs.

TABLE 5

Mean and range of brood sizes of myodocopid ostracods from Tampa Bay, Florida (*n* = number of specimens).

Species (*n*)	Mean	Range
Cylindroleberidae		
Amboleberis americana (1)	21	NA
Asteropterygion oculitristis (4)	15	11–18
Parasterope pollex (30)	8	4–12
Philomedidae		
Harbansus paucichelatus (15)	4	2–6
Pseudophilomedes darbyi (7)	5	3–10
Rutidermatidae		
Rutiderma darbyi (55)	3	2–6
Rutiderma mollitum (3)	3	2–4
Sarsiellidae		
Eusarsiella childi (45)	8	3–14
Eusarsiella cresseyi (7)	5	4–7
Eusarsiella disparalis (26)	7	4–11
Eusarsiella spinosa (4)	5	2–7
Eusarsiella tampa (5)	6	4–8
Eusarsiella texana (25)	6	2–12

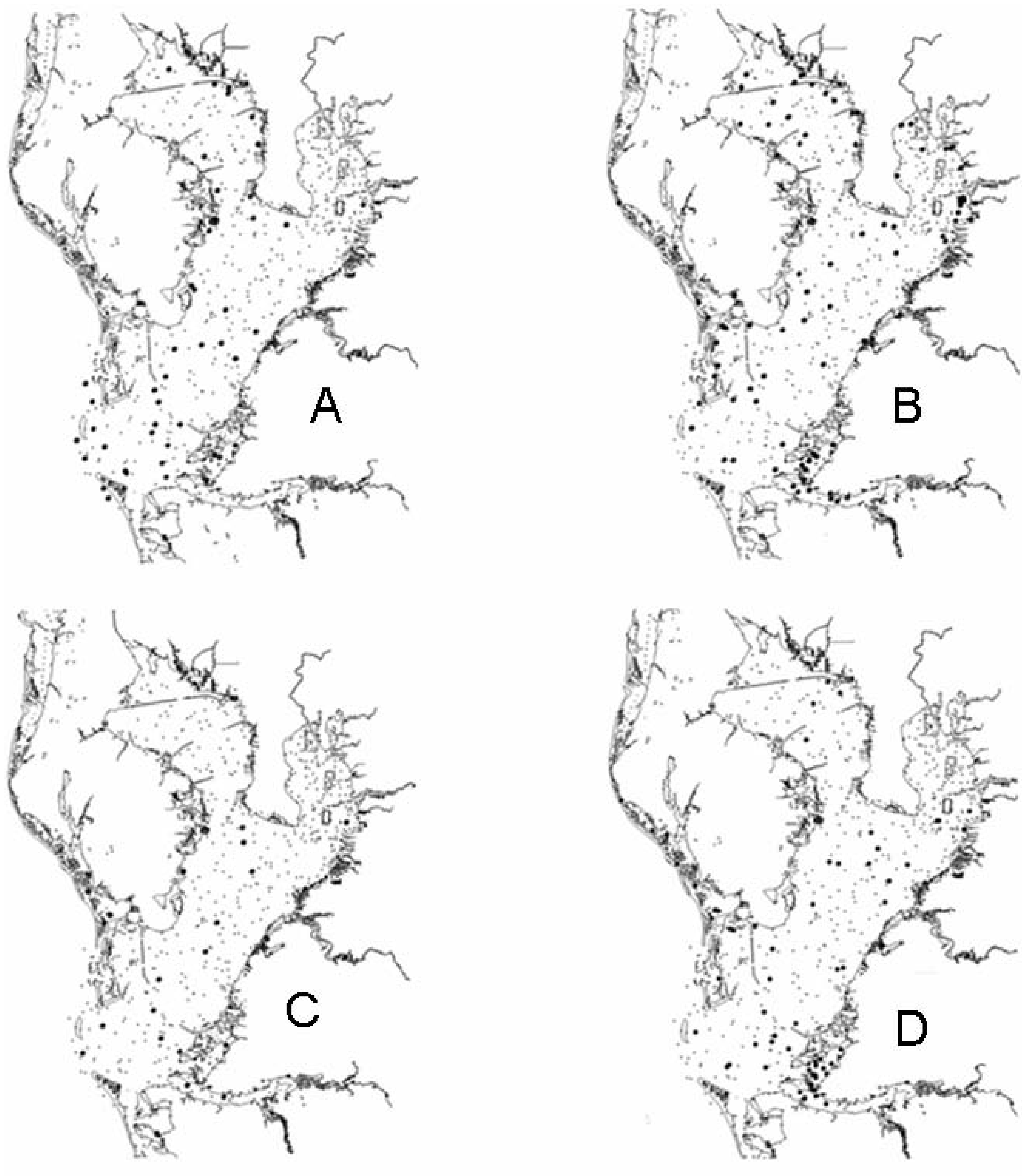

Figure 5. Distribution of A) *Eusarsiella childi*, B) *E. disparalis*, C) *E. spinosa*, and D) *E. texana* in Tampa Bay, Florida,

CONCLUSIONS

At least 20 species of myodocopid ostracods were identified from > 600 samples collected from Tampa Bay during 1995–2001. Numerical dominants included *P. pollex* and *R. darbyi*, and the most frequently occurring species included *P. pollex*, *R. darbyi*, and *E. disparalis*. Of the 10 most frequently occurring species, most were more likely to occur in coarser sediments, in more saline waters, and at greater depths than the mean for Tampa Bay. Given that many were described from coastal waters, the abiotic preferences reported here suggest that most of these ostracods penetrate the bay from the GOM. Whether there is a seasonal effect on the distribution is unknown since only wet season samples have been analyzed. However, bay salinities are noticeably higher during the dry season (Lewis and Estevez 1988), and ostracods may be more widespread when salinities are higher. Additionally, the observation that species such as *A. americana* tend to be found near the main shipping channel suggests that enhanced influx of Gulf waters via the shipping channels (Lewis and Estevez 1988) could facilitate immigration of neritic species. In contrast, *P. pollex* is a typical "bay species," less frequently collected in the lower reaches of the bay. Accordingly, *P. pollex* shows greater affinity for lower salinities, finer-grained sediments, and lower DO than the species presumed to originate in the GOM.

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