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### OCURRENCE OF TWO GALATHEID CRUSTACEANS, *MUNIDA FORCEPS* AND *MUNIDOPSIS BERMUDEZI*, IN THE CHESAPEAKE BIGHT OF THE WESTERN NORTH ATLANTIC OCEAN<sup>1,2</sup>

Living male specimens of *Munida forceps* A. Milne-Edwards and *Munidopsis bermudezi* Chace (Table 1) were collected on the continental slope and rise south of Norfolk Canyon off the coast of Virginia on 18-19 November 1974. An ovigerous female *M. bermudezi* was also collected on 14 September 1975 in the Norfolk Canyon. They were taken with a 15-m shrimp trawl (12-mm stretch mesh inner liner) towed from the RV *James M. Gillis* (University of Miami, Florida).

*Munida forceps* has been reported from 80 to 338 m within the Gulf of Mexico and in the south-

western Atlantic between lat. 22°46.5' and 26°37.0'N (Chace 1940, 1942; Springer and Bullis 1956; Bullis and Thompson 1965). Our find is consistent with the previously reported depth range, but it extends the geographic range of the species northward by 10° latitude.

*Munidopsis bermudezi* has been reported from the coast of Cuba (lat. 21°19'N, long. 76°05'W) at a depth of 2,654 m (Chace 1940, 1942), the Gulf of Mexico (lat. 25°50.5'N, long. 94°27'W) at 3,294 m (Pequegnat and Pequegnat 1970), and north of the Azores (lat. 45°26'N, long. 25°45'W) at 3,171 m (Sivertsen and Holthuis 1956).

The *Munida forceps* sample also included the galatheids *M. iris* A. Milne-Edwards and *M. longipes* A. Milne-Edwards and other decapods including *Bathynectes superbis* (Costa), *Cancer borealis* Stimpson, *C. irroratus* Say, *Homarus americanus* H. Milne Edwards, and penaeidean and caridean shrimps. The association of *M. forceps* with *M. iris* and *M. longipes* in our sample is previously unreported. Some previous records have shown associations with *M. stimpsoni* A. Milne-Edwards (Chace 1942) and with *M. flinti* Benedict and *M. irrasa* A. Milne-Edwards (Milne-Edwards 1880 from Pequegnat and Pequegnat 1970). Others (Benedict 1902; Bullis and Thompson 1965; Pequegnat and Pequegnat 1970) have not specified association of *M. forceps* with other galatheids.

TABLE 1.—Station and morphometric data for *Munida forceps* and *Munidopsis bermudezi* captured near Norfolk Canyon off the coast of Virginia. Length and width measurements in millimeters.

Item	<i>Munida forceps</i>		<i>Munidopsis bermudezi</i>	
	Male	Male	Female	
Station	79	86	35	
Collection	C74-499	C74-506	C74-168	
Location, lat.	36°43.2'N	36°41.6'N	36°57.9'N	
long.	74°38.0'W	73°47.0'W	73°21.5'W	
Date of collection	Nov. 1974	Nov. 1974	Sept. 1975	
Depth (m)	220-310	2,620-2,650	2,915-2,955	
Bottom temperature (°C)	10.6	3.0	2.3	
Bottom salinity (‰)	—	34.82	35.11	
Total length (rostral tip to posterior margin of telson)	34	81.4	83.2	
Carapace width, anterior	7.9	28.4	28.8	
posterior	10.4	31.0	31.5	
Carapace length (orbit to posterior margin)	13.5	33.5	33.5	
Carapace length (including rostrum)	18.5	44.8	43.8	
Cheliped (right) length	45	42.4	40.8	
Carpus length	4.0	8.5	7.5	
Merus length	15.2	14.5	13.0	
Propodus length	25.6	19.3	14.3	
Propodus width	4.5	8.8	8.0	
Dactylus length	15.1	10.5	8.3	
Second left pereopod length	28.8	48.7	46.5	

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In November 1974, *Munidopsis bermudezi* was associated with *M. curvirostra* Whiteaves. Previous accounts did not indicate association of *M. bermudezi* with other galatheids. Other decapods taken in the November sample were *Lithodes agassizii* Smith, *Stereomastis sculpta* (Smith), and penaeidean and caridean shrimps, including *Hymenodora gracilis* Smith, a species occurring in the Azores sample (Sivertsen and Holthuis 1956).

In September, *M. bermudezi* was associated with *M. bairdii* (Smith) and *M. crassa* (Smith), as well as *Lithodes agassizii* and caridean shrimp.

The ovigerous *M. bermudezi* had not shed all eggs onto the pleopods. The 19 external eggs were tan and averaged 2.8 mm in diameter. These eggs were spherical with no visible blastoderm and were recently extruded. The ovary was tan and very well developed. It contained 106 ova averaging 2.7 mm in diameter. All eggs were measured with an ocular micrometer.

We suspect that these species with tropical affinities are normally present, though rare, in the Chesapeake Bight; but they could be accidental migrants. In either case, the probability of detection was raised by the recent increase in sampling intensity in the vicinity of Norfolk Canyon as compared to other areas of the continental slope between Florida and North Carolina. The question of how far north the tropical fauna extends along the southeastern coast of North America is still unanswered (Briggs 1974). Cerame-Vivas and Gray (1966) noted that the inshore fauna of the North Carolina shelf was warm temperate (Carolinian) but that the offshore fauna was tropical. In a study of sea stars of North Carolina, Gray et al. (1968) found 13 species that occurred in a northward extension of the Caribbean Province along the outer shelf and that these species ranged slightly northward past Cape Hatteras.

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