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OCCURRENCE OF TWO GALATHEID CRUSTACEANS, MUNIDA FORCEPS AND MUNIDOPSIS BERMUDEZI, IN THE CHESAPEAKE BIGHT OF THE WESTERN NORTH ATLANTIC OCEAN1,2

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 Holthus 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 superbus (Costa), Cancer borealis Stimpson, C. irratus 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.

<table>
<thead>
<tr>
<th>Item</th>
<th>Munida forceps</th>
<th>Munidopsis bermudezi</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Station</td>
<td>79</td>
<td>86</td>
</tr>
<tr>
<td>Collection</td>
<td>C74-499</td>
<td>C74-506</td>
</tr>
<tr>
<td>Location, lat.</td>
<td>36°42.1'N</td>
<td>36°41.8'N</td>
</tr>
<tr>
<td>Location, long.</td>
<td>73°39.0'W</td>
<td>73°47.0'W</td>
</tr>
<tr>
<td>Date of collection</td>
<td>Nov. 1974</td>
<td>Nov. 1974</td>
</tr>
<tr>
<td>Depth (m)</td>
<td>220-310</td>
<td>2,620-2,650</td>
</tr>
<tr>
<td>Bottom temperature (°C)</td>
<td>10.3</td>
<td>3.0</td>
</tr>
<tr>
<td>Bottom salinity (‰)</td>
<td>34.82</td>
<td>3.51</td>
</tr>
<tr>
<td>Total length (rostral tip to posterior margin of telson)</td>
<td>34</td>
<td>81.4</td>
</tr>
<tr>
<td>Carapace width, anterior posterior</td>
<td>7.9</td>
<td>28.4</td>
</tr>
<tr>
<td>Carapace length (orbit to posterior margin)</td>
<td>10.4</td>
<td>31.0</td>
</tr>
<tr>
<td>Carapace length (including rostrum)</td>
<td>13.5</td>
<td>33.5</td>
</tr>
<tr>
<td>Cheliped (right) length</td>
<td>18.5</td>
<td>44.8</td>
</tr>
<tr>
<td>Cambus length</td>
<td>45</td>
<td>42.4</td>
</tr>
<tr>
<td>Propodus length</td>
<td>4.0</td>
<td>8.5</td>
</tr>
<tr>
<td>Merus length</td>
<td>15.2</td>
<td>14.5</td>
</tr>
<tr>
<td>Propodus width</td>
<td>25.6</td>
<td>19.3</td>
</tr>
<tr>
<td>Propodus width</td>
<td>4.5</td>
<td>8.8</td>
</tr>
<tr>
<td>Dactylus length</td>
<td>15.1</td>
<td>10.5</td>
</tr>
<tr>
<td>Second left pereopod length</td>
<td>28.8</td>
<td>48.7</td>
</tr>
</tbody>
</table>

1Research supported by National Science Foundation Grant GA-37651, J. A. Musick, Principal Investigator and by U.S. Department of Commerce, National Marine Fisheries Service Contract No. 03-4-043-383 for C.E.L. and P.A.H. participation.
2Contribution No. 717, Virginia Institute of Marine Science.
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 *Hymenodoragracilis* 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.

The authors are grateful for the assistance of Fenner A. Chace Jr., in confirming the identification of the specimens. All specimens have been deposited at the United States National Museum, Washington, D.C.

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