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Occurrence Of Some Parasites And A Commensal In The American Lobster, Homarus-Americanus, From The Mid-Atlantic Bight

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OCCURRENCE OF SOME PARASITES AND
A COMMENSAL IN THE AMERICAN LOBSTER,
HOMARUS AMERICANUS, FROM
THE MID-ATLANTIC BIGHT

Larvae of the nematode Ascarophis sp. were reported by Uzmann (1967b) from American lobsters collected from Hudson, Block, Veatch, and Corsair Canyons on the edge of the continental shelf east and south of southern New England (Fig. 1). Following parasitological examinations of over 3,000 coastal and offshore lobsters, Uzmann (1970) reported that the nematode larvae were restricted almost exclusively to offshore lobsters. Adult Ascarophis sp. are intestinal parasites of fishes (Uspenskaya 1953).

Although coastal and offshore lobsters occur off

northern and central New Jersey, coastal lobsters are scarce or absent south of Cape May, N J. There is an active offshore commercial lobster fishery along the edge of the continental shelf south to Norfolk Canyon (Fig. 1).

Materials and Methods

To determine whether offshore lobsters in the Mid-
Atlantic Bight have larval Ascarophis sp., we exam-
ined the guts of 218 American lobsters, Homarus americanus, collected from August 1975 through March 1977. Lobsters from this region had not been examined previously for parasites.

One hundred and ninety-seven of the lobsters exam-
ined were caught in lobster traps or trawl nets by commercial and research vessels in Norfolk and Washington Canyons and from the shelf and slope between and adjacent to those canyons (areas III-V, Fig. 1) at depths of 73-402 m. The remaining 21 lobsters were caught by trawl nets from research vessels off the coasts of Delaware and New Jersey at depths of 57-95 m (area VIII, Fig. 1).

The intestines and rectum were excised from live
lobsters on shipboard (70% of the samples) or in the laboratory at the Virginia Institute of Marine Science, split longitudinally, and fixed in 10% Formalin or in Davidson's fixative. No free parasites were found in the gut contents. In the laboratory, the gut was transferred to 35% glycerine in 70% ethanol, and part of the ethanol evaporated in a 55°C oven. Pieces of the gut were then laid open, pressed between two 35 x 50 mm slides, and examined for the presence of cysts. This procedure followed the recommendation of J. R. Uzmann.

Results

Thirty-nine American lobsters were infected with larval Ascarophis sp., encapsulated in the anterior
wall of the rectum (Table 1). The proportion of infec-
tion in 218 lobsters (17.9%) from the Mid-Atlantic
Bight was similar to that reported by Uzmann (1967b), when examined in a 2 x 2 contingency table and using Yates' correction for continuity (Elliott 1971). Uzmann (1967b) reported 77 infections in 314
lobsters (24.5%) collected east and south of southern New England. However, Boghen (1978) reported infection in the gills of 82 out of 233 lobsters (35.2%)

1 Contribution No. 1277, Virginia Institute of Marine Science,
Gloucester Point, VA 23062.

2 Reference to trade names does not imply endorsement by the
National Marine Fisheries Service, NOAA.

3 J. R. Uzmann, Northeast Fisheries Center Woods Hole Labora-
tory, National Marine Fisheries Service, NOAA, Woods Hole, MA
FIGURE 1.—Canyons and lobster sampling sites along the edge of the continental shelf, between Cape Hatteras and the eastern edge of Georges Bank.
Ascarophis sp. was obtained from the gills of 30 male lobsters and in 26 (20.5%) of 127 female lobsters. No significant difference in prevalence of infection between males and females, when size was ignored, could be demonstrated with a 2 x 2 contingency table analysis. This agrees with the absence of sex specificity in the canyon lobsters.


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<th>Date</th>
<th>Area</th>
<th>M</th>
<th>F</th>
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<td>III</td>
<td>26(1)</td>
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<td>16.2</td>
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<td>Dec. 1975</td>
<td>III</td>
<td>18(3)</td>
<td>18(3)</td>
<td>36(6)</td>
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<td>11.1</td>
<td>13.9</td>
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<td>19(6)</td>
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<td>31.3</td>
<td>31.6</td>
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<tr>
<td>Jan. 1976</td>
<td>IV</td>
<td>11(1)</td>
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<td>9.1</td>
<td>7.7</td>
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<tr>
<td>Apr. 1976</td>
<td>III</td>
<td>6(3)</td>
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<tr>
<td>Total</td>
<td>91(13)</td>
<td>127(26)</td>
<td>218(39)</td>
<td>4.3</td>
<td>20.5</td>
<td>17.9</td>
<td></td>
</tr>
</tbody>
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1. III. Norfolk Canyon and adjacent slope
2. IV. Between Norfolk and Washington Canyons
3. V. Washington Canyon
4. VIII. Between Wilmington and Hudson Canyons.

The variety of animal parasites and their intensity of infection are small in the Mid-Atlantic Bight lobsters. Differences in the occurrence and rates of infection by the larvae of the nematode Ascarophis sp. in the Mid-Atlantic Bight lobsters examined, an estimate of prevalence is inappropriate. Previously, Histriobdella was reported by Uzmann (1967a) in the gills and by Simon (1968) in the gills and bodies of New England lobsters, and by Boghen (1978) in the branchial chamber and gills of lobsters from Northumberland Straits.

One female lobster, 86 mm CL, caught in Norfolk Canyon in August 1975, was infected with cysts of an acanthocephalan, Corynosoma sp. Thirty-three cysts were found in the intestinal wall and in the mesenteries along the outside of the intestine. Adult Corynosoma sp. are parasites of mammals and aquatic birds; crustaceans are first intermediate hosts and fishes are second intermediate hosts (Yamaguti 1963).

According to Uzmann (1970), Corynosoma sp. is a discriminator of coastal lobster stocks. Therefore its presence in a lobster taken in Norfolk Canyon indicates that migration from inshore to offshore waters occurs. Montreuil (1954) reported that the acanthocephalan infections in lobsters from the Magdalen Islands, Gulf of St. Lawrence, varied with the sex of the lobster and by season: 20% of females and 20% of males had cysts seemingly acquired towards the end of summer and early fall. Boghen (1978) attributed the absence of cysts in his Northumberland Strait samples to the fact that the lobsters were collected before the end of summer.

Discussion

The variety of animal parasites and their intensity of infection are small in the Mid-Atlantic Bight lobsters. Differences in the occurrence and rates of infection by the larvae of the nematode Ascarophis sp. in the Mid-Atlantic Bight lobsters.
infection of Ascarophis and Corynosoma and of the commensal Histriobdella reported from American lobsters of the Mid-Atlantic Bight, southern New England waters, and the Gulf of St. Lawrence, are not large and could be attributed to differences in sample sizes or season of sampling. Peculiarly, cysts of the sporozoan Porospora sp. were not seen in Mid-Atlantic Bight lobsters, but occurred in most lobsters in the Gulf of St. Lawrence (Montreuil 1954; Boghen 1978) and were reported by Uzmann (1970) from southern New England waters. Cysts of the trematode Stichocotyle sp. were reported by Nickerson (1895) from Penobscot Bay, ME, and from lobster dealers in Boston, MA; by Linton (1940) from an unstated region, probably Woods Hole, MA; by Uzmann (1970) from southern New England waters; and by Montreuil (1954) from southern Nova Scotia or southeastern New Brunswick. Nickerson (1895) found the cysts only in the intestinal tract at the union of the intestine and rectum.

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RESILIENCE OF THE FISH ASSEMBLAGE IN NEW ENGLAND TIDPOOLS

Factors regulating density and species composition of tidepool fishes have been little studied, particularly in comparison to other elements of the intertidal community (Gibson 1982). Twenty-two collections of fishes were made in two tidepools at the Marine Science and Maritime Studies Center of Northeastern University at Nahant, MA, during summers from 1967 to 1985. Initially, the purpose was simply to demonstrate to my summer class in ichthyology the technique of collecting fishes with rotenone. After several years, it became apparent that there would be interest in examining long-term effects of repeated poisoning of the same pools. The purpose of this paper is to report the data from this series of samples and to compare the resilience of this New England tidepool fish fauna with studies done in the Gulf of California (Thomson and Lehner 1976), the central California coast (Grossman 1982), and South Africa (Beckley 1985). Unfortunately, there are no other similar tidepools in the area, so it was not possible to make control collections from unsampled pools.

Methods

The same two tidepools were sampled each summer from 1967 to 1985. The tidepools are located on the ocean side of East Point, in Broad Sound. The higher pool is at about 2 m elevation and is about 1 m deep at high tide; the lower pool is slightly below 1 m elevation, contains extensive red and brown algal growth, and is shallower. Average tidal amplitude is slightly over 3 m. One collection was made each year except for 1969, 1982, and 1983 when two collections were made, spaced about 2 wk apart. Collections

1 Contribution No. 134 from the Marine Science Institute, Northeastern University, Nahant, MA 01908.