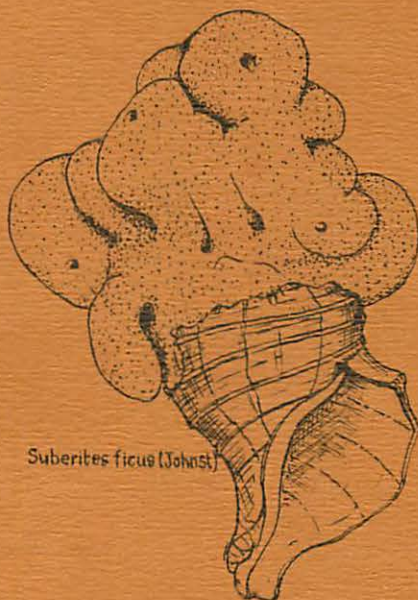


Curatorial Report Number 31

Nova Scotia Museum
1747 Summer Street
Halifax, Nova Scotia, Canada

Benthic Animals from Cruises P.114 and P.139 1973 and 1974

By Derek S. Davis
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Suberites ficus (Johnst.)

INTRODUCTION

In 1972 Dr. Paul Odense of Environment Canada collected specimens of benthic and planktonic marine animals for the Nova Scotia Museum. These were added to the museum collection and documented by Davis and Gilhen (1973). The continuation of Dr. Odense's cruise program with the research stern trawler "E. E. Prince" in 1973 and 1974 provided additional opportunities for collecting, and the author was able to join cruises P.114 (1973) and P.139 (1974). This personal involvement by a member of staff of the museum permitted much more effort to be devoted to the recording and collecting of animals obtained in the trawl samples.

During cruises P.114 and P.139 sampling for benthos was carried out with an Otter trawl in the following areas; Halifax Harbour approaches, Emerald Basin, Emerald Gully, Emerald Bank, the south side of Western Bank and Sable Island Bank. In all, there were 39 sets of the Otter trawl in eight days spent at sea. The data relating to the sets are given in Table 1 and the localities shown on the map (Fig. 1). During these cruises 12 sets with the Isaacs-Kidd mid-water trawl were also made and good samples of planktonic and pelagic species obtained. This material is not fully identified but is incorporated into the collection of the Nova Scotia Museum. It is however not dealt with in this report which is restricted to the benthic sampling.

The records of the species occurring in the Otter trawl samples were made as the catch was being sorted on deck. Species required for determination or for the collections or interpretive programs of the museum, were either frozen, or fixed in neutral 10% formalin in seawater. At the museum samples were transferred to 70% Isopropyl alcohol preservative and sorted, identified and accessioned over a period of months.

Determinations of species were made mainly by reference to Abbott (1974), Gosner (1971), Leim and Scott (1966), Miner (1950) and Smith (1964), with other specialised keys used in some cases. The Decapod crustacea were closely examined as part of a review of the total Decapod collection at the Nova Scotia Museum (Aldous, 1976). Although the determinations were not taken to the species level in some cases, all lots have been catalogued within the lowest possible taxa.

GENERAL COMMENTS ON THE COLLECTION

The catalogue of marine invertebrates published by Whiteaves (1901) clearly demonstrates the great variety of benthic forms that occurs on the continental shelf areas off Eastern Canada. However, not all the species documented are readily available for reference in museum collections. The collections made during the cruises P.114 and P.139 have helped to fill in some of the gaps in the collection of the Nova Scotia Museum and have added numerous records for both common and rarer species. Some groups, particularly Coelenterata and Nemertea, were found to be

very difficult to determine due to the poor condition of specimens and a lack of literature. Of a total of 125 species of invertebrates identified (excluding unidentified lots) there are four Porifera, three Coelenterata, 20 Chaetopoda, one Gephyrea, 23 Crustacea, two Pycnogonida, 41 Mollusca, 25 Echinodermata, four Bryozoa and one Brachiopoda. Of the Chordata there are three Tunicata and 34 fishes. About one third of the species were not previously represented in the collections of the Nova Scotia Museum. Records of particular interest are Axius serratus, a crustacean with poorly documented occurrence and the crab Bathynectes superbus recorded much further north than its normal range.

In terms of the distribution of individual species, the records made during the cruises can only be related to bottom type in a few cases. The surficial geology charts of the continental shelf provide a useful base for plotting the gross distributions of benthic animals, although the details of these distributions will vary at least as much as those of the surficial geology are known to do within the major units. The units of surficial geology employed by King (1970) for the Halifax to Sable Island map area (chart 4040-G) have been given for reference, with the information on sets, in Table I. When individual records of the benthic species are compared with these sediment units some general relationships become apparent. For example, the echinoid, Schizaster fragilis occurred only in sets made over silt/clay and gravel bottoms (7a,7a) and not in sets made over bottoms of gravel or sand with little silt content. This pattern of occurrence conforms to the known preference of this species for mud bottoms. In contrast, the asteroid, Ctenodiscus crispatus which is also commonly associated with mud bottoms, was more widely distributed. It occurred in 12 sets made over bottoms of mud, sand and gravel (6a, 8a and 8b).

The opportunistic collection of benthic animals, as carried out during these cruises, is bound to be limited by the low sampling efficiency of the trawl and the fact that 'rough' bottoms are avoided, in most cases, in preference to familiar, flat, smooth bottoms. However, the individual records of species when grouped together may eventually provide information on the distribution of benthic species that would otherwise only be obtained through extensive surveys.

The acquisition of a collection of this type draws attention to the lack of literature on the Canadian Atlantic fauna. It is almost impossible to identify the species in some groups with any degree of confidence, even though they may occur quite regularly in samples. The accumulation of information on species diversity and distribution forms a basis for detailed studies of individual species and of benthic communities; studies which are essential to the proper management of the biological resources of the continental shelf area. It is hoped that the museum collections and associated information will be valuable to taxonomic studies, the preparation of keys to the Canadian Atlantic fauna and eventually studies in ecology and zoogeography.

ACKNOWLEDGEMENTS

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SYSTEMATIC LIST OF SPECIES

All of the animals recorded from the trawl samples are included in the list. Not all have been fully identified and are thus put into more general groupings than species. The records are arranged in chronological order by sets and where material was retained for incorporation in the Nova Scotia Museum collection, the accession numbers are given. The number of specimens in each lot is given in parentheses at the end of each accession number. Groups labelled unidentified may include several species.

PROTOZOA

FORAMINIFERA. Some unidentified specimens attached to polychaete tubes and colonies of Hydroids and Bugula sp., trawled on Emerald Bank, 38 to 57 Fathoms. P.114.3, 1973-Z-502.23(50), P.114.4, 1973-Z-503.14(5), P.114.5, 1973-Z-504.14(50), and P.114.22, 1973-Z-519.3(45).

PORIFERA

Unidentified. Emerald Bank, 38 to 46 Fathoms. P.114.3, 1973-Z-502.18(1), P.139.1, 1974-Z-231.9(1), P.139.3, 1974-Z-233.8(1), P.139.5, 1974-Z-245.10(1). North of Sable Island, 26 to 28 Fathoms. P.114.18, 1973-Z-515.28(1). (Possibly Clathria delicata George and Wilson).

Polymastia robusta (Bowerbank). Western Bank, 97 to 101 Fathoms. P.139.9, 1974-Z-249.2(1).

Suberites ficus (Johnston). Common around Sable Island attached to stones and mollusc shells, 21 to 81 Fathoms. P.114.13, 1973-Z-511.3(1), P.114.17, 1973-Z-514.16(4), P.114.18, 1973-Z-515.5(4) and 1973-Z-515.43(1).

Chalina oculata (Pallas). Emerald Bank and north west of Sable Island, 38 to 53 Fathoms. P.114.3, 1973-Z-502.17(1), P.114.5, 1973-Z-504.5(1), P.114.21, 1973-Z-518.1(1).

Artemesina arcigera O. Schmidt. Emerald Bank, 39 to 49 Fathoms. P.114.26, 1973-Z-522.7(2).

COELENTERATA

HYDROMEDUSAE. Unidentified colonies from Emerald Bank and Sable Island area. 21 to 35 Fathoms. P.114.11, 1973-Z-509.5(1) and 1973-Z-509.6(15), P.114.13, 1973-Z-511.13(1), P.114.18, 1973-Z-515.16(1), 1973-Z-515.22(13), 1973-Z-515.24(1), 1973-Z-515.25(1), 1973-Z-515.26(1) and 1973-Z-515.27(1), P.114.25, 1973-Z-521.16(1), P.114.33, 1973-Z-528.18(10).

Hydractinia echinata Fleming. North of Sable Island, 22 to 28 Fathoms, colonies epizoic on shells occupied by Pagurus sp., P.114.14, P.114.18, 1973-Z-515.16(1), P.114.19, 1973-Z-516.18(1).

ANTHOZOA

Duva multiflora Verrill. Attached to stones, north and south-west of Sable Island and entrance to Halifax Harbour, 33 to 81 Fathoms. P.114.11, 1973-Z-509.18(3), P.114.17, 1973-Z-514.25(1), P.114.33, 1973-Z-528.14(34), P.114.34, 1973-Z-529.8(2).

Actiniaria unidentified. Emerald Bank, Western Bank and Sable Island area. 21 to 81 Fathoms. P.114.10, 1973-Z-508.5(2), P.114.11, 1973-Z-509.13(3), P.114.13, 1973-Z-511.14(1), P.114.14, 1973-Z-512.5(1), P.114.17, 1973-Z-514.40(1) and 1973-Z-514.43(16), P.114.18, 1973-Z-515.38(5), P.114.19, 1973-Z-516.8(1) and 1973-Z-516.10(2), P.114.22, 1973-Z-519.7(1), and 1973-Z-519.12(1), P.114.27, 1973-Z-523.2(2) and 1973-Z-523.3(1), P.139.14, 1974-Z-254.4(1).

Epizoanthus americanus Verrill. Emerald Bank, Emerald Gully and north of Sable Island, 24 to 74 Fathoms. Attached to wood or commensal with Pagurus sp., P.114.6, 1973-Z-505.1(1), P.114.19, 1973-Z-516.19(1), P.114.27, 1973-Z-523.10(3), P.114.28, 1973-Z-524.3(8), P.114.29, 1973-Z-525.7(1), P.139.2, 1974-Z-232.2(2).

NEMERTEA

Unidentified. Emerald Bank, 39 to 53 Fathoms. P.114.5, 1973-Z-504.11(1), P.114.26, 1973-Z-522.14(3).

ANNULATA

CHAETOPODA

Polychaeta unidentified. Emerald Bank, Sable Island area and entrance to Halifax Harbour, 21 to 57 Fathoms. P.114.3, 1973-Z-502.30(1) and 1973-Z-502.21(2), P.114.11, 1973-Z-509.12(1) and 1973-Z-509.17(1), P.114.13, 1973-Z-511.10(30), P.114.18, 1973-Z-515.32(1), P.114.18, 1973-Z-515.35(1), P.114.21, 1973-Z-512.12(1), P.114.22, 1973-Z-519.6(5), P.114.25, 1973-Z-521.22(1), P.114.33, 1973-Z-528.26(1), P.139.3, 1974-Z-233.7(1).

Polynoidae unidentified. Emerald Basin, Emerald Bank, Emerald Gully and north of Sable Island, 38 to 147 Fathoms. P.114.1, 1973-Z-500.7(6), P.114.3, 1973-Z-502.19(1), P.114.21, 1973-Z-518.10(1), P.114.27, 1973-Z-523.14(2), P.114.28, 1973-Z-524.8(4), P.114.29, 1973-Z-525.5(4).

Lepidonotus squamatus (Linné) Emerald Bank and Sable Island area, 21 to 81 Fathoms. P.114.11, 1973-Z-509.15(1), P.114.13, 1973-Z-511.12(3), P.114.17, 1973-Z-514.35(2) and 1973-Z-514.46(4).

Harmothoe extenuata Grube. North of Sable Island, 26 to 28 Fathoms.
P.114.18, 1973-Z-515.30(2).

Aphrodite aculeata Linnaeus. South of Sable Island, 21 to 22 Fathoms.
P.114.13, 1973-Z-511.4(2).

Laetmonice filicornis Kinberg. Emerald Bank, 76 to 77 Fathoms. P.114.2,
1973-Z-501.8(19).

Phyllodocidae unidentified. Emerald Bank, 42 to 53 Fathoms. P.114.5,
1973-Z-504.10(1).

Phyllodoce mucosa Oersted. North of Sable Island, 63 to 81 Fathoms.
P.114.17, 1973-Z-514.32(1).

Eteone lactea Claparède. Sable Island area, 26 to 28 Fathoms. P.114.12,
1973-Z-510.14(1), P.114.18, 1973-Z-515.29(1).

Eteone longa Fabricius. Emerald Bank and north of Sable Island, 24 to 81
Fathoms. P.114.17, 1973-Z-514.48(1), P.114.19, 1973-Z-516.14(1), P.114.26,
1973-Z-522.12(3).

Nereidae unidentified. Emerald Bank and Emerald Basin, 38 to 147 Fathoms.
P.114.1, 1973-Z-500.9(4), P.114.4, 1973-Z-503-13(1), P.114.5, 1973-Z-504.9(1).

Nereis pelagica Linnaeus. North of Sable Island, 26 to 81 Fathoms. P.114.17
1973-Z-514.34(1) and 1973-Z-514.45(1), P.114.18, 1973-Z-515.31(1).

Nephtys incisa Malmgren. Emerald Bank and Emerald Basin, 76 to 147 Fathoms.
P.114.1, 1973-Z-500.8(9), P.114.2, 1973-Z-501.13(3).

Onuphis conchylega Sars. Emerald Bank, 39 to 67 Fathoms. P.114.26, 1973-Z-
522.11(4), P.114.27, 1973-Z-523.11(1).

Dodecaceria concharum Oersted. Emerald Bank, 56 to 57 Fathoms. P.114.22,
1973-Z-519.9(4).

Cistenides gouldi Verrill. North of Sable Island, 63 to 81 Fathoms. P.114.17,
1973-Z-514.36(1), and 1973-Z-514.47(1).

Maldane sarsi Malmgren. Entrance to Halifax Harbour, 56 Fathoms. P.114.33, 1975-Z-528.21(10).

Nichomache lumbricalis (Fabricius). Northwest of Sable Island, 43 to 47 Fathoms. P.114.21, 1973-Z-518.16(1).

Sternaspis fossor Stimpson. North of Sable Island, 26 to 28 Fathoms. P.114.18, 1973-Z-515.33(1).

Sabella penicillus Linnaeus. Entrance to Halifax Harbour, 56 Fathoms. P.114.33, 1973-Z-528.17(1).

Potamilla neglecta Sars. Emerald Bank, 39 to 67 Fathoms. P.114.5, 1973-Z-504.8(9), P.114.25, 1973-Z-521.15(8), P.114.26, 1973-Z-522.23(1), P.114.27, 1973-Z-523.12(1).

Filograna implexa Berkeley. Emerald Bank, 40 Fathoms. P.114.25, 1973-Z-521.5(3).

Spirorbis spirillum Linnaeus. Sable Island area, on shells and skate egg cases, 26 to 38 Fathoms. P.114.10, 1973-Z-508.11(3), P.114.18, 1973-Z-515.20(13).

Spirorbis borealis Daudin. North of Sable Island, on skate egg cases. 26 to 28 Fathoms. P.114.18, 1973-Z-515.20(11).

HIRUDINEA

Hirudinea unidentified. South of Sable Island, 21 to 22 Fathoms. The specimen was detached and could not be associated with any particular fish species. P.114.13, 1973-Z-511.1(1).

GEPHYREA

Sipunculida unidentified. Emerald Bank, 39 to 49 Fathoms. P.114.26, 1973-Z-522.13(2).

Phascolion strombi (Montagu). Entrance to Halifax Harbour, 56 Fathoms. P.114.33, 1973-Z-528.20(5).

ARTHROPODA

CRUSTACEA

Ostracoda unidentified. Emerald Bank, 56 to 57 Fathoms. P.114.22, 1973-Z-519.13(1).

Balanus sp. North of Sable Island, 26 to 28 Fathoms. P.114.18, 1973-Z-515.39(7).

Balanus hameri Ascanius. Emerald Bank and Western Bank, 43 to 101 Fathoms. P.139.5, 1974-Z-245.3(5) and 1974-245.4(8), P.139.9, 1974-Z-249.3(3).

Cirolana sp. Emerald Basin, specimen from fish stomach, 147 Fathoms. P.114.1, 1973-Z-500.15(1).

Cirolana polita Harger. Emerald Gully, 69 to 74 Fathoms. P.114.28, 1973-Z-524.6(1).

Limnoria lignorum (Rathke). North of Sable Island on submerged wood, 63 to 81 Fathoms. P.114.17, 1973-Z-514.29(57).

Gnathia cerina (Stimpson). North of Sable Island, on submerged wood, 63 to 81 Fathoms. P.114.17, 1973-Z-514.23(4).

Amphipoda unidentified. Emerald Basin, Emerald Bank, Sable Island area and entrance to Halifax Harbour, 27 to 147 Fathoms. P.114.1, 1973-Z-500.16(2), P.114.4, 1973-Z-503.16(2) and 1973-Z-503.17(1), P.114.10, 1973-Z-508.8(2) and 1973-Z-508.9(1), P.114.11, 1973-Z-509.16(5), P.114.12, 1973-Z-510.12(5), P.114.17, 1973-Z-514.28(1), P.114.33, 1973-Z-528.15(1).

Caprella sp. Sable Island area, 33 to 81 Fathoms. P.114.11, 1973-Z-509.4(1), P.114.17, 1973-Z-514.27(1).

Caprella linearis (L.) North of Sable Island, 22 to 24 Fathoms. P.114.19, 1973-Z-516.7(10) and 1973-Z-516.15(2).

Meganictiphanes norvegica M. Sars. Northwest of Sable Island, 43 to 47 Fathoms. P.114.21, 1973-Z-518.17(3).

Thysanoesa inermis (Kröyer). Southwest of Sable Island and entrance to Halifax Harbour, 27 to 56 Fathoms. P.114.12, 1973-Z-510.11(1), P.114.33, 1973-Z-528.18(2).

Pandalus sp. Emerald Bank, 76 to 77 Fathoms. P.114.2, 1973-Z-501.11(7).

Pandalus montagui Leach. Emerald Bank, northwest of Sable Island and entrance to Halifax Harbour. 43 to 62 Fathoms. P.114.22, 1973-Z-519.10(2), P.114.33, 1973-Z-528.12(1), P.114.34, 1973-Z-529.3(8), P.114.21, 1973-Z-518.7(18).

Pandalus borealis Kröyer. Entrance to Halifax Harbour, 56 to 62 Fathoms. P.114.33, 1973-Z-528.11(5), P.114.34, 1973-Z-529.4(8).

Dichelopandalus leptocerus Smith. Emerald Bank, Emerald Gully, Western Bank, north and northwest of Sable Island, 38 to 112 Fathoms. P.114.2, 1973-Z-501.11(7), P.114.4, 1973-Z-503.18(4), P.114.17, 1973-Z-514.41(23), P.114.21, 1973-Z-518(1), P.114.22, 1973-Z-519.14(2), P.114.27, 1973-Z-523.15(1), P.114.29, 1973-Z-525.9(5), P.139.1, 1974-Z-231.8(1), P.139.9, 1974-Z-249.6(17), P.139.10, 1974-Z-250.4(1), P.139.11, 1974-Z-251.3(3), P.139.12, 1974-Z-252.6(1), P.139.13, 1974-Z-253.2(6), P.139.14, 1974-Z-254.2(5).

Crago septemspinosus (Say). Emerald Bank and north of Sable Island, 26 to 49 Fathoms. P.114.4, 1973-Z-508.19(1), P.114.18, 1973-Z-515.34(4), P.114.25, 1973-Z-521.19(2), P.114.26, 1973-Z-522.21(1).

Homarus americanus Milne-Edwards. Western Bank, 110 to 112 Fathoms. P.139.13,

Axius serratus Stimpson. Emerald Gully, 67 to 69 Fathoms. P.114.29, 1973-Z-525.11(1).

Pagurus arcuatus Squires. Emerald Bank and Sable Island area, 26 to 44 Fathoms. P.114.6, 1973-Z-505.2(1), P.114.18, 1973-Z-515.40(6), P.114.11, 1973-Z-509.19(7), P.114.12, 1973-Z-510.7(1), P.114.14, 1973-Z-512.6(1), P.114.18, 1973-Z-515.40(6).

Pagurus pubescens Kröyer. Emerald Bank, Emerald Gully and Sable Island area, 29 to 81 Fathoms. P.114.10, 1973-Z-508.4(2), P.114.14, 1973-Z-503.6(8), P.114.17, 1973-Z-514.37(1), P.114.25, 1973-Z-521.20(1), P.114.27, 1973-Z-523.9(3), P.114.28, 1973-Z-524.4(8), P.139.1, 1974-Z-231.4(1), P.139.3, 1974-Z-233.4(1), P.139.4, 1974-Z-234.1(1), P.139.5, 1974-Z-245.6(3).

Pagurus acadianus (Benedict) (=P. bernhardus L.). Emerald Bank, Emerald Gully and northwest of Sable Island, 39 to 64 Fathoms, P.114.21, 1973-Z-518.8(2), P.114.29, 1973-Z-525.8, P.139.2, 1974-Z-232.3(2), P.139.4, 1973-Z-234.5(1) and 234.6(1).

Cancer irroratus Say. Emerald Bank and Sable Island area, 27 to 42 Fathoms. P.114.4, 1973-Z-503.15(1), P.114.12, 1973-Z-510.3(1), P.139.1, 1974-Z-231.6(2).

Bathynectes superbus (Costa). Western Bank, 90 to 102 Fathoms, P.139.11, 1974-Z-251.1(2), P.139.12.

Hyas coarctatus Leach. Emerald Bank, Western Bank and northwest of Sable Island, 40 to 101 Fathoms. P.114.21, 1973-Z-518.14(1), P.114.25, 1973-Z-521.2(3), P.114.26, 1973-Z-522.22(3), P.139.5, 1974-Z-245.8(1), P.139.9, 1974-Z-249.4(2).

PYCNOGONIDA

Nymphon sp. Entrance to Halifax Harbour, 56 Fathoms. P.114.33, 1973-Z-528.1(3).

Chaetonymphon hirtipes (Bell). Entrance to Halifax Harbour, 56 to 62 Fathoms. P.114.33, 1973-Z-528.2(34), P.114.34, 1973-Z-529.10(2).

MOLLUSCA

AMPHINEURA

Tonicella marmorea (Fabricius). Emerald Bank, 39 to 49 Fathoms. P.114.26, 1973-Z-522.15(1).

GASTROPODA

Margarites groenlandicus Gmelin. South west of Sable Island, 50 to 51 Fathoms. P.114.9, 1973-Z-507.6(1).

Epitonium groenlandicum (Chemnitz). Emerald Bank, 38 to 42 Fathoms. In stomach of a flounder. Shells were occupied by Pagurus sp. P.114.4, 1973-Z-503.5(4).

Natica clausa Broderip and Sowerby. Emerald Bank and northwest of Sable Island, 38 to 47 Fathoms. P.114.4, 1973-Z-503.10(1), P.114.21, 1973-Z-518.6(1), P.139.4, 1974-Z-234.4(1).

Lunatia heros (Say). North of Sable Island, 26 to 28 Fathoms. P.114.18, 1973-Z-515.10(1).

Bulbus smithii (Brown). Emerald Bank, 38 to 42 Fathoms. P.114.4, 1973-Z-503.4(1).

Aporrhais occidentalis Beck. Emerald Bank and Sable Island area, 26 to 77 Fathoms. P.114.2, 1973-Z-501.4(1), P.114.9, 1973-Z-507.5(1), P.114.11, 1973-Z-509.14(1), P.114.18, 1973-Z-515.9(5), P.114.27, 1973-Z-523.8(1).

Buccinum undatum Linné and/or B. scalariforme Möller. Emerald Bank and Sable Island area, 22 to 81 Fathoms. Records include egg cases. P.114.10, 1973-Z-508.6(5), P.114.11, 1973-Z-509.7(6) and 509.8(9), P.114.12, 1973-Z-510.1(1), 510.5(1), 510.9(1), 510.10(1) and 510.13(1), P.114.13, 1973-Z-511.6(1), and 511.15(7), P.114.14, 1973-Z-512.4(40), P.114.17, 1973-Z-514.8(1) and 514.38(60), P.114.18, 1973-Z-515.17(4), P.114.19, 1973-Z-516.9(1) and 516.11(1), P.114.20, P.114.21, 1973-Z-518.5(4), 518.13(1), and 518.15(1), P.114.25, 1973-Z-521.9(2), P.114.26, 1973-Z-522.3(1), P.139.1, 1974-Z-231.7(1), P.139.4, 1974-Z-234.2(1), 234.3(1).

Neptunea sp. Egg cases. North of Sable Island, 63 to 81 Fathoms. P.114.17, 1973-Z-514.13(2).

Neptunea despecta tornatus Gould. Southwest of Sable Island, 36 to 38 Fathoms. P.114.10, 1973-Z-508.10(1).

Neptunea lyrata decemcostata (Say). Whole animals and egg cases. North of Sable Island, 26 to 28 Fathoms. P.114.18, 1973-Z-515.11(2), 515.12(4) and 515.17(1).

Colus stimpsoni Mörch. Emerald Bank and Sable Island area, 22 to 49 Fathoms. P.114.12, 1973-Z-510.4(1), P.114.19, 1973-Z-516.6(1), P.114.25, 1973-Z-521.4(1), P.114.26, 1973-Z-522.4(2).

Unidentified Prosobranch egg cases. Southwest of Sable Island, 33 to 35 Fathoms. P.114.11, 1973-Z-509.20(3).

Cylichna gouldi Couthouy. Emerald Basin, 147 Fathoms. P.114.1, 1973-Z-500.5(1).

Scaphander punctostriatus Mighels and Adams. Entrance to Halifax Harbour and north of Sable Island, 56 to 81 Fathoms. P.114.17, 1973-Z-514.21(13), P.114.33, 1973-Z-528.7(1).

Nudibranchia unidentified. Emerald Bank, 39 to 41 Fathoms. P.139.1, 1974-Z-231.10(1).

Palio lessoni (d'Orbigny). Emerald Bank, 38 to 41 Fathoms. P.114.3, 1973-Z-502.16(1).

Aeolidia papillosa (Linné). South west of Sable Island, 33 to 38 Fathoms. P.114.10, 1973-Z-508.7(1), P.114.11, 1973-Z-509.2(1).

SCAPHOPODA

Dentalium entale stimpsoni Henderson. Emerald Basin, Emerald Bank and Emerald Gully, 58 to 147 Fathoms. P.114.1, 1973-Z-500.1(13), P.114.27, 1973-Z-523.13(2), P.114.28, 1973-Z-524.5(4), P.114.29, 1973-Z-525.6(1).

PELECYPODA

Nuculana tenuisulcata Couthouy. North of Sable Island, 63 to 81 Fathoms. P.114.17, 1973-Z-514.31(1).

Yoldia limatula Say. Entrance to Halifax Harbour, 56 Fathoms. P.114.33, 1973-Z-588.6(1).

Limopsis minuta Philippi. Emerald Basin, 147 Fathoms. P.114.1, 1973-Z-500.2(1).

Mytilus edulis Linné. North of Sable Island, 26 to 28 Fathoms. P.114.18, 1973-Z-515.19(4).

Modiolus modiolus Linné. Emerald Bank, 39 to 49 Fathoms. P.114.26, 1973-Z-522.5(4), P.139.1, 1974-Z-231.3(1), P.139.4.

Placopecten magellanicus Gmelin. Sable Island area, 21 to 28 Fathoms. P.114.11, P.114.13, 1973-Z-511.2(1), P.114.18, 1973-Z-515.7(2), P.114.19, P.114.20, P.114.26.

Anomia aculeata Gmelin. Emerald Bank and north of Sable Island, 26 to 53 Fathoms. P.114.5, 1973-Z-504.13(1), P.114.18, 1973-Z-515.21(13).

Cyclocardia borealis (Conrad). Emerald Bank, 39 to 41 Fathoms. P.139.3, 1974-Z-233.6(1).

Astarte undata Gould. Emerald Basin, Emerald Bank and Emerald Gully, 40 to 147 Fathoms. P.114.1, 1973-Z-500.6(1), P.114.25, 1973-Z-521.7(1), P.114.27, 1973-Z-523.7(1), P.114.28, 1973-Z-524.9(1).

Serripes groenlandicus Bruguière. North of Sable Island, 26 to 28 Fathoms. P.114.18, 1973-Z-515.1(1).

Clinocardium ciliatum Fabricius. North of Sable Island, 63 to 81 Fathoms. P.114.17, 1973-Z-514.30(1).

Cerastoderma pinnulatum (Conrad). Emerald Bank, 76 to 77 Fathoms. P.114.2-1973-Z-501.9(1).

Spisula polynyma Stimpson. Sable Island area, 26 to 38 Fathoms. P.114.10, 1973-Z-508.2(1), P.114.11, 1973-Z-509.1(1), P.114.18, 1973-Z-515.2(1).

Tellina agilis Stimpson. Emerald Bank, 40 Fathoms. P.114.25, 1973-Z-521.8(4).

Arctica islandica (Linné). Emerald Bank, Western Bank and Sable Island area, 21 to 110 Fathoms. P.114.1, P.114.10, 1973-Z-508.3(1), P.114.11, 1973-Z-509.11(4), P.114.12, 1973-Z-510.6(1), P.114.13, 1973-Z-511.8(2), P.114.14, 1973-Z-512.1(2), P.114.18, 1973-Z-515.3(6), P.114.26, 1973-Z-522.2(1), P.139.12, 1974-Z-252.4(1), P.139.13, 1974-Z-253.5(1).

Liocyma fluctuosa (Gould). Emerald Bank, 39 to 41 Fathoms. P.139.3, 1974-Z-233.5(1).

Hiatella arctica Linné. Entrance to Halifax Harbour, Emerald Bank and north of Sable Island, 22 to 81 Fathoms. P.114.17, 1973-Z-514.39(2), P.114.18, 1973-Z-515.18(11), P.114.19, 1973-Z-516.13(3), P.114.25, 1973-Z-521.6(1), P.114.33, 1973-Z-528.19(1).

Cyrtodaria siliqua (Spengler). Sable Island area, 22 to 81 Fathoms. P.114.11, 1973-Z-509.3(2), P.114.14, 1973-Z-512.2(2), P.114.17, 1973-Z-514.6(3), P.114.18, 1973-Z-515.4(2) and 515.8(1), P.114.19, 1973-Z-516.1(1), P.114.20, 1973-Z-517.1(1), P.114.21, 1973-Z-518.4(2).

Zirphaea crispata (Linné). North of Sable Island, boring into submerged wood, 22 to 81 Fathoms. P.114.17, 1973-Z-514.20(7), P.114.19, 1973-Z-516.5(7).

Teredo spp. North of Sable Island in submerged wood, 22 to 81 Fathoms. P.114.17, 1973-Z-514.17(55), 514.18(33) and 514.19(8), P.114.19, 1973-Z-516.4(1).

CEPHALOPODA

Ommastrephes illecebrosa (Lesueur). Emerald Bank, Emerald Gully and Western Bank, 39 to 117 Fathoms. P.114.29, 1973-Z-525.1(1), P.139.1, 1974-Z-231.1(6), P.139.2, P.139.3, 1974-Z-233.1(6), P.139.4, P.139.8, P.139.9, P.139.10, P.139.11, P.139.13, P.139.14.

Rossia sublevis Verrill. Entrance to Halifax Harbour and Sable Island area, 26 to 56 Fathoms. P.114.18, 1973-Z-515.13(1), P.114.33, 1973-Z-528.9(1).

Bathypolypus arcticus (Prosch). Entrance to Halifax Harbour, Emerald Bank, Emerald Gully and Western Bank, 56 to 90 Fathoms. P.114.27, 1973-Z-523.1(1), P.114.29, 1973-Z-525.2(1), P.114.33, 1973-528.10(1), P.139.12, 1974-Z-252.2(1).

ECHINODERMATA

ASTEROIDEA

Ctenodiscus crispatus (Retzius). Entrance to Halifax Harbour, Emerald Bank, Emerald Gully and Sable Island area, 38 to 87 Fathoms. P.114.3, 1973-Z-502.5(1), P.114.4, P.114.9, 1973-Z-507.1(10), P.114.17, 1973-Z-514.9(7), P.114.21, 1973-Z-518.3(5), P.114.22, P.114.27, 1973-Z-523.5(6), P.114.28, 1973-Z-524.1(20), P.114.29, 1973-Z-525.4(10), P.114.30, 1973-Z-526.2(6), P.114.33, 1973-Z-528.3(4), P.114.34, 1973-Z-529.6(2).

Astropecten americanus Verrill. Western Bank, 88 to 112 Fathoms. P.139.9, 1974-Z-249.7(1), P.139.10, 1974-Z-250.2(8), P.139.11, 1974-Z-251.2(4), P.139.12, 1974-Z-252.3(7), and 252.5(20), P.139.13, 1974-Z-253.1(14), P.139.14, 1974-Z-254.1(5)

Astropecten sp. Emerald Basin and Emerald Gully, 71 to 147 Fathoms. P.114.1 1973-Z-500.11(1), P.114.30, 1973-Z-526.5(2).

Pontaster hebitus Sladen. Emerald Basin, Emerald Bank and Emerald Gully, 38 to 147 Fathoms. P.114.1, 1973-Z-500.10(28), P.114.2, 1973-Z-501.10(6), P.114.3, 1973-Z-502.8(1), P.114.3, 1973-Z-503.12(1), P.114.30, 1973-Z-526.4(2).

Pentagonaster granularis (O.F.Müller). Emerald Bank, 43 to 46 Fathoms. P.139.5, 1974-Z-245.2(1).

Hippasteria phrygiana (Parelius). Emerald Basin, Emerald Gully, Emerald Bank, Western Bank and Sable Island area, 21 to 147 Fathoms. P.114.1, P.114.3, 1973-Z-502.2(3), P.114.4, 1973-Z-503.3(3), P.114.5, 1973-Z-504.1(3), P.114.9, 1973-Z-507.2(1), P.114.13, 1973-Z-511.5(1), P.114.14, P.114.17, P.114.22, 1973-Z-519.1(1), P.114.23, P.114.24, P.114.25, 1973-Z-521.1(4), P.114.26, P.114.27, 1973-Z-523.4(1), P.114.28, P.114.29, P.114.30, P.139.1, P.139.2, P.139.3, P.139.4, P.139.5, 1974-Z-245.1(1), P.139.9, 1974-Z-249.1(1), P.139.11, 1974-Z-251.5(1), P.139.12.

Poraniomorpha borealis Verrill. Emerald Bank, 38 to 41 Fathoms. P.114.3, 1973-Z-502.14(1).

Henricia sanguinolenta (O. F. Müller). Emerald Bank, Western Bank and north of Sable Island, 26 to 101 Fathoms. P.114.3, 1973-Z-502.6(1), P.114.18, 1973-Z-515.4(1), P.114.25, 1973-Z-521.12(4), P.139.9, 1974-Z-249.8(1), P.139.10, 1974-Z-250.3(1).

Solaster endeca (Linné). Entrance to Halifax Harbour and Emerald Bank, 39 to 62 Fathoms. P.114.21, P.114.25, 1973-Z-521.4(1), P.114.26, 1973-Z-522.1(5), P.114.33, 1973-Z-528.4(1), P.114.34, 1973-Z-529.7(2).

Crossaster papposus (Linné). Emerald Bank, 38 to 41 Fathoms. P.114.3, 1973-Z-502.13(1).

Pteraster militaris (O. F. Müller). Emerald Bank and Emerald Gully. 39 to 69 Fathoms. P.114.26, 1973-Z-522.19(2), P.114.29, 1973-Z-525.13(1).

Asteriidae and Echinasteridae unidentified. Emerald Bank and north of Sable Island, 26 to 81 Fathoms. P.114.3, 1973-Z-502.7(5), P.114.17, 1973-Z-514.15(2), P.114.18, 1973-Z-515.14(1), P.114.22, 1973-Z-519.8(1), P.114.26, 1973-Z-522.6(4), P.139.3, 1974-Z-233.3(2).

Asterias vulgaris Verrill. Emerald Bank, Emerald Gully and Sable Island area, 22 to 81 Fathoms. P.114.3, 1973-Z-502.4(1), P.114.4, 1973-Z-503.2(4), P.114.5, 1973-Z-504.3(1), P.114.10, 1973-Z-508.12(1), P.114.11, P.114.13, P.114.14, 1973-Z-515.9(1), P.114.17, 1973-Z-514.24(2), P.114.18, P.114.19, 1973-Z-516.16(1), P.114.20, P.114.21, P.114.23, P.114.25, 1973-Z-521.13(2), P.114.26, P.114.27, P.139.5, 1974-Z-245.5(1).

Urasterias lincki (Müller and Troschal). Entrance to Halifax Harbour, Emerald Bank and Emerald Gully, 56 to 69 Fathoms. P.114.34, 1973-Z-529.5(1), P.114.22, 1973-Z-519.8(2) (part), P.114.29, 1973-Z-525.10(1).

OPHIUROIDEA

Gorgonocephalus arcticus Leach. Entrance to Halifax Harbour and southwest of Sable Island, 36 to 56 Fathoms. P.114.10, 1973-Z-508.14(1), P.114.33, 1973-Z-528.8(2).

Ophiopholis aculeata (Linné). Entrance to Halifax Harbour, Emerald Bank and north of Sable Island, 26 to 81 Fathoms. The Sable Island specimens were in holes in submerged wood. P.114.3, 1973-Z-502.12(3), P.114.17, 1973-Z-514.22(27), P.114.18, 1973-Z-515.37(12) and 515.4(1), P.114.25, 1973-Z-521.11(2), P.114.26, 1973-Z-522.17(1), P.114.27, 1973-Z-523.17(1), P.114.33, 1973-Z-528.24(11), P.139.5, 1974-Z-245.9(3).

Ophioderma brevispina (Say). Emerald Bank, Emerald Gully and north of Sable Island, 26 to 77 Fathoms. P.114.2, 1973-Z-501.7(5), P.114.17, 1973-Z-514-33(20), P.114.18, 1973-Z-515.36(11), P.114.27, 1973-Z-523.16(1), P.114.28, 1973-Z-524.7(1).

Ophiura sarsi Lütken. Entrance to Halifax Harbour, Emerald Bank, Emerald Gully, Emerald Basin, Western Bank and Sable Island area, 22 to 147 Fathoms. P.114.1, 1973-Z-500.13(1), P.114.3, 1973-Z-502.10(3), P.114.4, 1973-Z-503.8(12) and 503.11(2), P.114.9, 1973-Z-507.3(13), P.114.10, 1973-Z-508.15(9), P.114.11, 1973-Z-509.9(1), P.114.14, 1973-Z-512.8(2), P.114.19, 1973-Z-516.2(2), P.114.20, 1973-Z-517.2(2), P.114.21, 1973-Z-518.2(4), P.114.22, 1973-Z-519.4(1), P.114.26, 1973-Z-522.8(6), P.114.27, 1973-Z-523.6(2), P.114.29, 1973-Z-525.12(1), P.114.33, 1973-Z-528.25(10), P.114.34, 1973-Z-529.9(5), P.139.1, 1974-Z-231.5(1), P.139.2, 1974-Z-232.4(2), P.139.3, 1974-Z-233.2(4), P.139.13, 1974-Z-253.4(1), P.139.14, 1974-Z-254.3(1).

Ophiura robusta Agres. Emerald Bank, 38 to 57 Fathoms. P.114.3, 1973-Z-502.11(19), P.114.5, 1973-Z-504.12(3), P.114.22, 1973-Z-519.11(1), P.114.25, 1973-Z-521.10(19), P.114.26, 1973-Z-522.16(5).

ECHINOIDEA

Strongylocentrotus droebachiensis (O. F. Müller). Entrance to Halifax Harbour, Emerald Bank and Sable Island area, 22 to 56 Fathoms. P.114.3, 1973-Z-502.9(9), P.114.4, P.114.5, 1973-Z-504.4(1), P.114.9, P.114.10, 1973-Z-508.1(2), P.114.11, P.114.14, 1973-Z-512.3(1), P.114.18, P.114.19, P.114.20, P.114.21, P.114.24, P.114.25, 1973-Z-521.17(1), P.114.26, P.114.33, 1973-Z-528.5(1), P.139.1, P.139.3, P.139.4, P.139.5, 1974-Z-245.7(1).

Echinarachnius parma (Lamarck). Emerald Bank and Sable Island area, 21 to 81 Fathoms. P.114.3, 1973-Z-502.3(3) and 502.15(1), P.114.4, 1973-Z-503.1(7), P.114.5, 1973-Z-504.2(5), P.114.9, 1973-Z-507.4(2), P.114.10, 1973-Z-508.13(1), P.114.11, 1973-Z-509.10(1), P.114.13, 1973-Z-511.7(1), P.114.17, P.114.18, P.114.19, P.114.20, P.114.21, P.114.22, P.114.23, P.114.24, P.114.25, 1973-Z-521-3(1), P.114.26, P.139.2, P.139.3.

Schizaster fragilis Düben and Koren. Emerald Bank, Emerald Basin, Emerald Gully and Western Bank, 58 to 147 Fathoms. P.114.1, 1973-Z-500.3(8), P.114.2, 1973-Z-501.5(2), P.114.27, P.114.28, 1973-Z-524.2(18), P.114.29, 1973-Z-525.3(8), P.114.30, 1973-Z-526.3(4), P.139.11, 1974-Z-251.4(1).

HOLOTHUROIDEA

Holothuroidea unidentified. Entrance to Halifax Harbour and Emerald Bank, 40 to 56 Fathoms. P.114.25, 1973-Z-521.21(1), P.114.33, 1973-Z-528.16(3).

Cucumaria frondosa (Gunnerus). Emerald Bank and Sable Island area, 21 to 81 Fathoms. P.114.3, 1973-Z-502.1(2), P.114.9, 1973-Z-507.7(2), P.114.10, P.114.11, P.114.13, P.114.14, P.114.17, 1973-Z-514.14(4), P.114.19, P.114.20, P.114.21, 1973-Z-518.11, P.114.22, P.114.24.

Thryone briareus (Lesueur). Emerald Bank, 39 to 49 Fathoms. P.114.26, 1973-Z-522.20(1).

Psolus phantapus (Strussenfeldt). North of Sable Island, 63 to 81 Fathoms. P.114.17, 1973-Z-514.26(1).

Molpalia musculus Risso. Emerald Bank and Emerald Basin, 76 to 147 Fathoms. P.114.1, 1973-Z-500.14(6), P.114.2, 1973-Z-501.14(3)..

PROSOPYGIA

BRYOZOA

Bryozoa unidentified. On shells, skate egg cases etc. Emerald Basin, Emerald Bank and Sable Island areas, 21 to 147 Fathoms. P.114.1, 1973-Z-500.17(4), P.114.3, 1973-Z-502.22(2), P.114.13, 1973-Z-511.9(1), 511.16(1) and 511.42(1), P.114.18, 1973-Z-515.6(16), 515.23(2) and 515.42(1), P.114.19, 1973-Z-516.3(5), 516.12(1) and 516.17(1), P.114.22, 1973-Z-519.5(1), P.114.23, 1973-Z-520.1(1), P.114.26, 1973-Z-522.10(1).

Pedicellina cernua Pallas. On skate egg cases, north of Sable Island, 26 to 28 Fathoms. P.114.18, 1973-Z-515.20(8).

Crisia eburnea Linné. Emerald Bank, 40 Fathoms. P.114.25, 1973-Z-521.18(1).

Bugula turrita (Desor). Emerald Bank, 56 to 57 Fathoms. P.114.22, 1973-Z-519.2(1).

Alcyonidium verrilli Osburn. Entrance to Halifax Harbour, 56 Fathoms.
P.114.33, 1973-Z-528.22(1).

BRACHIOPODA

Terebratulina septentrionalis (Couthouy). Emerald Bank, 39 to 49 Fathoms.
P.114.26, 1973-Z-522.18(1).

CHORDATA

TUNICATA

Ciona intestinalis Linné. Emerald Bank, 76 to 77 Fathoms. P.114.2, 1973-Z-501.12(1).

Boltenia ovifera (Linné). Western Bank, 88 to 91 Fathoms. P.139.10, 1974-Z-250.5(1).

Bostrichobranchus pilularis (Verrill). Entrance to Halifax Harbour, 56 Fathoms. P.114.33, 1973-Z-528.23(1).

PISCES

Mxyine glutinosa Linnaeus. Northern hagfish. North of Sable Island, 63 to 81 Fathoms. P.114.1, P.114.17, 1973-Z-514.11(1).

Squalus ancanthias Linnaeus. Spiny dogfish. Emerald Bank, Emerald Gully and Sable Island area, 26 to 87 Fathoms. P.114.3, P.114.11, P.114.18, P.114.30.

Rajidae unidentified, egg cases. Emerald Bank, north and northwest of Sable Island, 22 to 81 Fathoms. P.114.17, 1973-Z-514.10(3), P.114.18, P.114.19, P.114.20, P.114.21, P.114.22, P.114.24.

Raja unidentified. Some very large specimens. Emerald Bank and Sable Island area. 21 to 81 Fathoms. P.114.5, 1973-Z-504.6(3), P.114.9, P.114.10, P.114.11, P.114.12, P.114.13, P.114.17, 1973-Z-514.12(1), P.114.18, P.114.21, P.114.28, P.114.23.

Raja erinacea Mitchill. Little skate. Emerald Gully, 67 to 87 Fathoms. P.114.29, P.114.30.

Raja radiata Donovan. Thorny skate. Emerald Bank, Western Bank, Sable Island area, 22 to 117 Fathoms. P.114.2, 1973-Z-501.2(1), P.114.3, P.114.4, P.114.5, P.114.6, P.114.9, P.114.10, P.114.11, P.114.17, P.114.18, P.114.19, P.114.20, P.114.22, P.114.23, P.114.24, P.114.25, P.114.27, P.139.2, P.139.3, P.139.4, P.139.5, P.139.10, P.139.11, P.139.14.

Raja senta Garman. Smooth skate. Emerald Bank and north of Sable Island, 26 to 53 Fathoms. P.114.3, P.114.5, P.114.6, P.114.18, 1973-Z-515.15(1).

Alosa pseudoharengus (Wilson) Alewife. Emerald Bank and Emerald Gully, 44 to 87 Fathoms. P.114.2, P.114.6, P.114.28, P.114.29, P.114.30.

Clupea harengus harengus Linnaeus. Atlantic herring. Emerald Basin, Emerald Bank, Emerald Gully, northwest of Sable Island, 36 to 147 Fathoms. P.114.1, P.114.2, P.114.20, P.114.21, P.114.22, P.114.27, P.114.29, P.139.3.

Argentina silus Ascanius. Atlantic argentine. Emerald Basin, Emerald Bank, Emerald Gully, Western Bank, 38 to 147 Fathoms. P.114.1, P.114.2, P.114.3, P.114.29, P.139.9.

Mauroliticus muelleri (Gmelin). Muller's pearlsides. Emerald Bank, 42 to 53 Fathoms. P.114.5, 1973-Z-504.7(1).

Gadidae unidentified. Emerald Bank and southwest of Sable Island, 27 to 41 Fathoms. P.114.12, 1973-Z-510.8(2), P.139.1, 1974-Z-231.2(2).

Brosme brosme (Müller). Cusk. Emerald Bank, Emerald Gully, Western Bank, 39 to 112 Fathoms. P.114.2, P.114.29, P.139.2, P.139.10, P.139.13.

Gadus morhua Linnaeus. Atlantic cod. Emerald Bank, Emerald Gully and Sable Island area, 22 to 147 Fathoms. P.114.1, P.114.3, P.114.4, P.114.5, P.114.6, P.114.9, P.114.10, P.114.11, P.114.12, P.114.14, P.114.17, P.114.19, P.114.20, P.114.21, P.114.22, P.114.23, P.114.24, P.114.25, P.114.26, P.114.27, P.114.29, P.139.1, P.139.2, P.139.3, P.139.4, P.139.5.

Melanogrammus aeglefinus (Linnaeus). Haddock. Emerald Bank, Western Bank and Sable Island area, 38 to 101 Fathoms. P.114.2, P.114.3, P.114.5, P.114.6, P.114.17, P.114.21, P.114.22, P.114.23, P.114.24, P.114.25, P.114.26, P.114.27, P.114.28, P.114.29, P.114.30, P.139.1, P.139.2, 1974-Z-232.1(4), P.139.3, P.139.4, P.139.5, P.139.9.

Merluccius albidus (Mitchill). Offshore hake. Emerald Basin, Emerald Gully, Emerald Bank, Western Bank and north of Sable Island, 42 to 147 Fathoms. P.114.1, P.114.2, P.114.5, P.114.17, P.114.22, P.114.27, P.114.28, P.114.29, P.114.30, P.139.9, P.139.14.

Merluccius bilinearis (Mitchill). Silver hake. Emerald Basin, Emerald Gully, Emerald Bank, and Western Bank, 38 to 147 Fathoms. P.114.1, 1973-Z-500.4(8), P.114.2, P.114.4, P.114.5, P.114.6, P.114.22, P.114.27, P.114.28, P.114.30, P.139.9, P.139.10, P.139.11, P.139.12, P.139.14.

Pollachius virens (Linnaeus). Pollock. Emerald Basin, Emerald Gully and Emerald Bank, 38 to 147 Fathoms. P.114.1, P.114.4, P.114.5, P.114.23, P.114.27, P.114.28, P.114.30, P.139.5.

Urophycis sp. Hake. Western Bank, 97 to 101 Fathoms. P.139.7, 1974-Z-249.5(1).

Zenopsis ocellata (Storer). American john dory. Western Bank, 88 to 91 Fathoms. P.139.10, 1974-Z-250.1(1), P.139.12, 1974-Z-252.1(1).

Ammodytes americanus DeKay. American sand lance. Emerald Bank, 38 to 45 Fathoms. P.114.4, 1973-Z-503.7(5), P.114.5, P.114.23.

Scomber scombrus Linnaeus. Atlantic mackerel. Emerald Bank, 40 to 77 Fathoms. P.114.2, P.139.4.

Anarhichas lupus Linnaeus. Atlantic wolffish. Emerald Bank and northwest of Sable Island, 38 to 67 Fathoms. P.114.3, P.114.4, P.114.5, P.114.6, P.114.21, P.114.22, P.114.23, P.114.24, P.114.25, P.114.26, P.114.27, P.139.1, P.139.2, P.139.3, P.139.4, P.139.5.

Lumpenus maculatus (Fries). Daubed shanny. Northwest of Sable Island, 43 to 47 Fathoms. P.114.21, 1973-Z-518.9(1).

Lumpenus lumpretaeformis (Walbaum). Snake blenny. Off Halifax Harbour, 56 to 62 Fathoms. P.114.33, 1973-Z-528.27(2), P.114.34, 1973-Z-529.1(4).

Macrozoarces americanus (Bloch and Schneider). Ocean pout. Sable Island area, 33 to 81 Fathoms. P.114.11, P.114.17, P.114.21.

Peprilus triacanthus (Peck). Butterfish. Emerald Bank, 58 to 67 Fathoms. P.114.27.

Sebastes marinus (Linnaeus). Redfish. Emerald Basin, Emerald Bank, Emerald Gully, Western Bank and north of Sable Island, 26 to 147 Fathoms. P.114.1, P.114.2, 1973-Z-501.1(8), P.114.3, P.114.5, P.114.17, P.114.18, P.114.22, P.114.30, P.139.9, P.139.10.

Hemitripterus americanus (Gmelin). Atlantic sea raven. Emerald Bank and Sable Island area, 26 to 51 Fathoms. P.114.6, P.114.9, P.114.10, P.114.11, P.114.12, P.114.14, 1973-Z-512.7(1), P.114.18, P.114.20, P.114.21, P.139.1.

Myxocephalus octodecemspinosus (Mitchill). Longhorn sculpin. Emerald Bank, Emerald Gully and Sable Island area, 21 to 74 Fathoms. P.114.4, P.114.5, P.114.9, P.114.10, P.114.11, P.114.12, P.114.13, P.114.14, P.114.18, P.114.19, P.114.20, P.114.24, P.114.28.

Cyclopterus lumpus Linnaeus. Lumpfish. Sable Island area, 21 to 38 Fathoms. P.114.10, P.114.13, P.114.20.

Pleuronectidae unidentified. Emerald Bank, 76 to 77 Fathoms. P.114.2, 1973-Z-501.15(1) juvenile.

Glyptocephalus cynoglossus (Linnaeus). Witch flounder. Emerald Basin, Emerald Bank, Western Bank and southwest of Sable Island, 27 to 147 Fathoms. P.114.1, P.114.2, P.114.12, P.139.9, P.139.10, P.139.11, P.139.14.

Hippoglossoides platessoides (Fabricius) . American plaice. Emerald Bank, Emerald Gully and Sable Island area, 21 to 87 Fathoms. P.114.2, 1973-Z-501.3(1), P.114.3, P.114.4, P.114.5, P.114.6, P.114.9, P.114.10, P.114.11, P.114.12, P.114.13, P.114.14, P.114.17, P.114.19, P.114.20, P.114.21, P.114.22, P.114.23, P.114.24, P.114.25, P.114.26, P.114.27, P.114.29, P.114.30, P.139.1, P.139.3, P.139.4.

Hippoglossus hippoglossus (Linnaeus). Atlantic halibut. Off Halifax Harbour, Emerald Bank, Western Bank and southwest of Sable Island, 38 to 117 Fathoms. P.114.4, P.114.5, P.114.9, P.114.22, P.114.25, P.114.26, P.114.27, P.114.34, 1973-Z-529.2(1), P.139.1, P.139.3, P.139.4, P.139.5, P.139.10, P.139.14.

Limanda ferruginea (Storer). Yellowtail flounder. Emerald Bank and Sable Island area, 21 to 57 Fathoms. P.114.3, P.114.5, P.114.9, P.114.10, P.114.11, P.114.12, P.114.13, P.114.14, P.114.20, P.114.21, P.114.22, P.114.23, P.139.2, P.139.3.

Lophius americanus Valenciennes. Monkfish. Emerald Basin, Emerald Bank, Emerald Gully, Western Gully, Western Bank and Sable Island area, 38 to 147 Fathoms. P.114.1, P.114.4, P.114.5, P.114.6, P.114.9, P.114.17, P.114.22, P.114.27, P.114.30, 1973-Z-526.1(1), P.139.2, P.139.3, P.139.4, P.139.10, P.139.11, P.139.14.

Set No.	Date	N. S. Museum Accession Number	Duration (Mins.)	Locality	Position at start		Position at end		Depth (fms.)	Bottom Type
					Lat.	Long.	Lat.	Long.		
P.114.1	15.4.73	1973-Z-500	45	Emerald Basin	43°52'30"N	62°55'00"W	43°50'30"N	62°56'30"W	147	7a
P.114.2	15.4.73	1973-Z-501	45	Emerald Bank	43°42'15"N	62°40'00"W	43°40'30"N	62°41'30"W	76-77	6a
P.114.3	15.4.73	1973-Z-502	60	Emerald Bank	43°39'45"N	62°30'00"W	43°37'30"N	62°26'30"W	38-41	8b
P.114.4	15.4.73	1973-Z-503	60	Emerald Bank	43°37'10"N	62°26'30"W	43°33'45"N	62°25'00"W	38-42	8b
P.114.5	15.4.73	1973-Z-504	60	Emerald Bank	43°33'45"N	62°24'30"W	43°33'45"N	62°21'00"W	42-53	8a
P.114.6	15.4.73	1973-Z-505	60	Emerald Bank	43°33'45"N	62°22'50"W	43°30'30"N	62°24'00"W	44	8a
P.114.9	16.4.73	1973-Z-507	80	S.W. of Sable Island	43°24'15"N	60°51'00"W	43°25'30"N	60°46'30"W	50-51	8a
P.114.10	16.4.73	1973-Z-508	60	S.W. of Sable Island	43°31'45"N	60°43'30"W	43°34'30"N	60°42'30"W	36-38	8a
P.114.11	16.4.73	1973-Z-509	54	S.W. of Sable Island	43°36'45"N	60°43'00"W	43°39'30"N	60°41'30"W	33-35	8a
P.114.12	16.4.73	1973-Z-510	60	S.W. of Sable Island	43°46'00"N	60°37'30"W	43°47'50"N	60°34'00"W	27-28	8a
P.114.13	16.4.73	1973-Z-511	60	S. of Sable Island	43°50'15"N	60°10'15"W	43°50'15"N	60°05'00"W	21-22	8a
P.114.14	16.4.73	1973-Z-512	45	S. of Sable Island	43°46'00"N	60°02'15"W	43°44'00"N	59°58'30"W	29-32	8a
P.114.17	17.4.73	1973-Z-514	50	N. of Sable Island	44°08'30"N	59°27'30"W	44°09'30"N	59°31'00"W	63-81	8a
P.114.18	17.4.73	1973-Z-515	30	N. of Sable Island	44°02'30"N	59°45'30"W	44°02'00"N	59°47'30"W	26-28	8a
P.114.19	17.4.73	1973-Z-516	30	N. of Sable Island	44°03'00"N	60°07'00"W	44°02'30"N	60°09'30"W	22-24	8a
P.114.20	17.4.73	1973-Z-517	30	N.W. of Sable Island	44°08'30"N	60°35'00"W	44°09'15"N	60°37'00"W	36	8a
P.114.21	17.4.73	1973-Z-518	30	N.W. of Sable Island	44°15'30"N	60°54'30"W	44°16'45"N	60°55'30"W	43-47	8a
P.114.22	18.4.73	1973-Z-519	52	Emerald Bank	43°38'30"N	62°17'15"W	43°39'30"N	62°13'30"W	56-57	8a
P.114.23	18.4.73	1973-Z-520	30	Emerald Bank	43°37'30"N	62°22'30"W	43°37'15"N	62°24'30"W	40-45	8a
P.114.24	18.4.73	no sample	45	Emerald Bank	43°37'30"N	62°26'30"W	43°38'30"N	62°29'30"W	38-40	8b
P.114.25	18.4.73	1973-Z-521	45	Emerald Bank	43°38'40"N	62°29'30"W	43°36'30"N	62°26'50"W	40	8b
P.114.26	18.4.73	1973-Z-522	60	Emerald Bank	43°37'00"N	62°26'00"W	43°39'40"N	62°23'00"W	39-49	8a-8b
P.114.27	18.4.73	1973-Z-523	60	Emerald Bank	43°40'15"N	62°22'30"W	43°43'15"N	62°23'00"W	58-67	8a-6a
P.114.28	18.4.73	1973-Z-524	45	Emerald Gully	43°44'00"N	62°23'30"W	43°46'30"N	62°25'00"W	69-74	6a
P.114.29	18.4.73	1973-Z-525	45	Emerald Gully	43°44'30"N	62°28'00"W	43°43'45"N	62°31'30"W	67-69	6a
P.114.30	18.4.73	1973-Z-526	60	Emerald Gully	43°44'30"N	62°33'00"W	43°46'30"N	62°37'15"W	71-87	6a
P.114.33	19.4.73	1973-Z-528	30	Halifax, S.E. Buoy	44°27'30"N	63°20'40"W	44°26'15"N	63°22'30"W	56	8b
P.114.34	19.4.73	1973-Z-529	30	Halifax, S.E. Buoy	44°26'30"N	63°22'00"W	44°27'40"N	63°20'30"W	56-62	8b
P.139.1	24.6.74	1974-Z-231	60	Emerald Bank	43°39'15"N	62°30'30"W	43°37'00"N	62°26'30"W	39-41	8b
P.139.2	24.6.74	1974-Z-232	60	Emerald Bank	43°36'30"N	62°25'50"W	43°33'15"N	62°22'15"W	39-48	8a
P.139.3	24.6.74	1974-Z-233	60	Emerald Bank	43°36'00"N	62°24'00"W	43°38'30"N	62°28'00"W	39-41	8a-8b
P.139.4	24.6.74	1974-Z-234	60	Emerald Bank	43°37'50"N	62°29'30"W	43°33'45"N	62°28'00"W	40-43	8b
P.139.5	24.6.74	1974-Z-245	55	Emerald Bank	43°32'45"N	62°28'30"W	43°29'00"N	62°28'30"W	43-46	8b
P.139.9	25.6.74	1974-Z-249	60	S. of Western Bank	43°04'50"N	61°35'00"W	43°03'20"N	61°40'00"W	97-101	6a
P.139.10	25.6.74	1974-Z-250	60	S. of Western Bank	43°03'00"N	61°40'00"W	43°02'00"N	61°44'45"W	88-91	6a
P.139.11	25.6.74	1974-Z-251	60	S. of Western Bank	43°01'00"N	61°46'00"W	43°00'15"N	61°49'40"W	101-102	6a
P.139.12	25.6.74	1974-Z-252	60	S. of Western Bank	43°00'30"N	61°49'00"W	43°02'00"N	61°43'45"W	90	6a
P.139.13	25.6.74	1974-Z-253	60	S. of Western Bank	43°01'45"N	61°43'30"W	43°03'40"N	61°38'15"W	110-112	6a
P.139.14	25.6.74	1974-Z-254	60	S. of Western Bank	43°04'00"N	61°36'15"W	43°06'20"N	61°32'15"W	112-117	6a

Table 1. Station data for all sets of Otter trawl during "E.E.Prince" Cruises P.114 and P.139 in 1973 and 1974. Depths are given in fathoms as recorded on the ship. Bottom types are taken from King (1970) as follows:- 6a: Sambro sand, mainly silty and clayey sand with some sandy gravel, 7a: LaHave clay, silty clay, 8a: Sable Island sand and gravel; sand with less than 50% gravel, and 8b: Sable Island sand gravel, gravel with less than 50% sand.

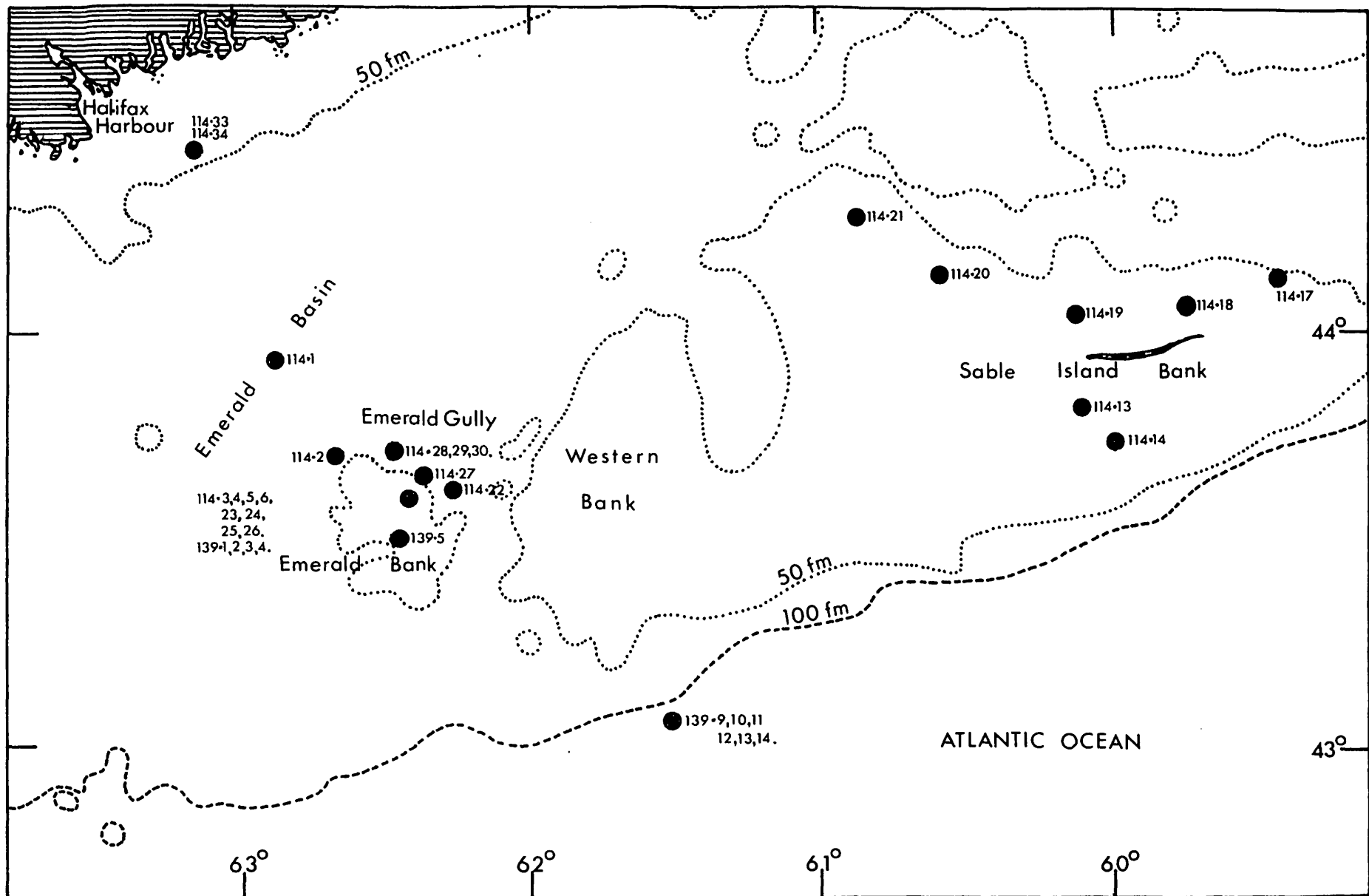


Fig. 1. Approximate positions of sets with Otter trawl made during cruises P.114 (1973) and P.139 (1974). The numbers are the cruise and set numbers which in some cases cover the same area. Based upon United States Navy, Hydrographic chart No. 6610. Scale 1: 1,532, 215.