

Reports

1965

Check list of the marine invertebrates of Virginia

Marvin L. Wass

Virginia Institute of Marine Science

Follow this and additional works at: <https://scholarworks.wm.edu/reports>



Part of the [Aquaculture and Fisheries Commons](#), [Marine Biology Commons](#), and the [Terrestrial and Aquatic Ecology Commons](#)

Recommended Citation

Wass, M. L. (1965) Check list of the marine invertebrates of Virginia. Special scientific report (Virginia Institute of Marine Science); no. 24, 3rd revision. Virginia Institute of Marine Science, College of William and Mary. <https://doi.org/10.21220/V5Q30X>

This Report is brought to you for free and open access by W&M ScholarWorks. It has been accepted for inclusion in Reports by an authorized administrator of W&M ScholarWorks. For more information, please contact scholarworks@wm.edu.

VIRGINIA INSTITUTE OF MARINE SCIENCE
GLOUCESTER POINT, VIRGINIA

CHECK LIST OF THE MARINE INVERTEBRATES
OF VIRGINIA

SPECIAL SCIENTIFIC REPORT NO. 24 (Third Revision)

August 1965

VIRGINIA INSTITUTE OF MARINE SCIENCE
GLOUCESTER POINT, VIRGINIA

CHECK LIST OF THE MARINE INVERTEBRATES
OF VIRGINIA

Compiled by
Marvin L. Wass

SPECIAL SCIENTIFIC REPORT NO. 24 (Third Revision)

W. J. Hargis, Jr.
Director

August 1965

CONTENTS

	Page
Porifera.	3
Coelenterata.	4
Ctenophora.	7
Platyhelminthes	8
Rhynchocoela.	11
Entoprocta.	12
Ectoprocta.	12
Phoronidea.	14
Annelida.	14
Sipunculoidea	20
Mollusca.	21
Arthropoda.	28
Echinodermata	42
Chaetognatha.	44
Hemichordata.	44
Chordata.	45
References.	46

INTRODUCTION

This list is the third revision of a preliminary list compiled by Dr. Willis G. Hewatt in 1959. This latest revision has been shortened by the deletion of most oceanic species. Conversely, a number of estuarine species have been added through further work. Those species known from the published work of the Chesapeake Biological Laboratory, Solomons Island, Maryland, have been included.

For several groups the list should be quite complete; for others, such as the amphipods, of which there are 21 unidentified species in the VIMS collection, much taxonomic work remains. Since many species have been identified only by the compiler, a few errors may be present.

Numerous literature references deemed pertinent have been added, with some annotations. While the taxonomic study of macroinvertebrates in the Chesapeake estuary seems near completion, the compilation of ecological and life history information appears only to have reached a threshold of understanding. Most of such information included herein should be regarded as general and subject to revision as intensive studies are made.

General appreciation is herewith extended to the many specialists who have identified material and to Miss Evelyn Wells for checking the introductory material and references, to Mrs. Beverly Ripley for a near perfect typing of the stencils and to Miss Kathleen Fary for the task of duplication, collation and binding. While this revision, as the previous ones, has been done in haste, it is believed that the number of errors and omissions have been substantially lessened. The compiler will appreciate receipt of corrections, additions, and suggestions for improvement.

EXPLANATION OF SYMBOLS

Authority

Insertion of a second set of initials in a line pertains to the investigator supplying data on local conditions. Asterisks indicate literature records.

*CBW	Charles Branch Wilson
*CRS	Clarence R. Shoemaker
DM	Donald R. Moore, Institute of Marine Science, Miami, Florida
ECT	Eng-Chow Tan, Scripps Institute of Oceanography
FAC	Fenner A. Chace, Jr., Division of Marine Invertebrates, USNM
FJSM	Frank J. S. Maturo, Jr., University of Florida
GG	George Grant, Narragansett Marine Laboratory

*HGR Horace G. Richards
HPJ Harry P. Jeffries, Narragansett Marine Laboratory
HW Harry W. Wells, Florida State University
JDA Jay D. Andrews, VIMS
JM John McCain, Jr., Division of Marine Invertebrates, USNM
*JPM John Percy Moore
JR Joseph Rosewater, Division of Molluscs, USNM
*JWH Joel W. Hedgpeth
KB Kenneth J. Boss, Ichthyological Laboratory, USNM
LT Lowell Thomas, Institute of Marine Science, Miami, Florida
MP Marian Pettibone, Division of Marine Invertebrates, USNM
OH Olga Hartman, Allan Hancock Foundation
PB Pierre Brunel, Marine Biological Station, Gaspé, Quebec
PC Paul Chanley, VIMS, Eastern Shore
*RAL Robert A. Littleford
*RCO Raymond C. Osburn
*RPC Rheinart P. Cowles
RM-A Reinaldo Morales-Alamo, VIMS
TEB Thomas E. Bowman, U. S. National Museum
WGH Willis G. Hewatt, Texas Christian University
*WH Willard D. Hartman, Peabody Museum of Natural History,
Yale University
WJH William J. Hargis, Jr., VIMS
*WLT Willis L. Tressler
WVE Willard Van Engel, VIMS

Representative Areas

Combinations of the letter "Y" followed by a numeral refer to distance from the mouth of the York River. Initials used to represent a few areas are as follows:

ES - Eastern Shore
GP - Gloucester Point
SI - Solomons Island
TML - Tue Marsh light at the mouth of York River
YS - York Spit

Information on salinity is usually an approximation. Population numbers refer to maximums observed.

PHYLUM PORIFERA

Class Demospongiae

Order Hadromerina

Clionidae - See Hopkins, 1962.

Cliona celata Grant, 1826. SH, dominant species Seaside, ES, 14-36 o/oo.

Cliona lobata Hancock, 1849. SH, mostly Bayside (14-27 o/oo) ES.

Cliona truitti Old, 1941. SH, tolerates lowest salinity, ES, 3-27 o/oo.

Cliona vastifica Hancock, 1849. SH, scarce species, Bayside and Seaside, ES, 14-36 o/oo.

Order Haplosclerina

Haliclonidae

Haliclona permollis (Bowerbank, 1866). MW, abundant at Gloucester Point, Virginia.

Haliclona loosanoffi (Hartman, 1958). WH, Solomons, Maryland.

Order Poecilosclerina

Microcionidae

Microciona prolifera (Ellis and Solander, 1786). MW, red finger sponge abundant on piling in medium to high salinities in summer, in deeper water in winter.

Myxillidae

Lissodendoryx isodictyalis (Carter, 1882). MW, stinking sponge, abundant at medium salinities in summer.

Order Halichondrina

Halichondridae

Halichondria bowerbanki Burton, 1930. MW, most conspicuous fouling sponge in summer, medium to high salinity. Large, yellow species.

Order Choristida

Craniellidae

Craniella crania (Müller, 1776). MW, abundant in sparse aggregations, ES opposite Rapp. R., on coarse sand bottom, 30 ft., summer.

Craniella laminaris (George and Wilson, 1919). MW, abundant at mouth of York R. on sand to silty-sand, summer.

PHYLUM COELENTERATA

(Several species of hydroids and medusae listed by Cowles (1930) have been omitted because locality information was lacking.)

Class Hydrozoa

Order Anthomedusa

Suborder Gymnoblastera

Corynidae

Sarsia tubulosa (M. Sars, 1835). WGH, common on the sponge Halichondria.

Corynitis agassizi McCrady, 1858. RM-A, on VIMS pier pilings from May 14 - Oct. 20, 1960; reproducing July 16 - Oct. 6. (Equals Zanclaea costata Gegenbaur, 1856, Woods Hole Keys.)

Stylactis hooperi Sigerfoos, 1899. RM-A, on Zostera at VIMS.

Stylactis arge Clark, 1882. RPC, on Nassarius obsoletus shells.

Rathkeidae

Rathkea octopunctata (Sars, 1835). RAL, Solomons Island, Maryland. Abun. mid-December, 1938; 13.3 - 17.6 o/oo, 2.5 - 5.9° C. Preyed on by Cyanea.

Pennaridae

Pennaria tiarella (Ayres, 1854). WGH, TML on floating algae. James R., Norfolk, on test panel, June 16, 1965, Dale Calder.

Eudendridae

Eudendrium carneum Clarke, 1882. RPC, Fort Wool.

Podocoryne carnea M. Sars, 1846. RM-A, found once on VIMS pier pilings, Nov. 4, 1960.

Hydractinidae

Hydractinia echinata (Fleming, 1828). WGH, common on shells housing hermit crabs.

Bougainvilleidae

B. rugosa Clarke, 1882. WGH, common on Halichondria and Molgula. RM-A, probably this species present on VIMS pier pilings May 9 - Dec. 3, 1960; reproducing Oct. 10-20, 1960.

Calyptospadix cerulea Clarke, 1882. RPC, Fort Wool.

Nemopsis bachel L. Agassiz, 1849. RM-A, common medusa in winter, York River.

Suborder Calytoblastea

Campanularidae

- Clytia cylindrica Agassiz, 1862. WGH, abundant on Halecium, Hampton Bar. RM-A, Clytia sp. on VIMS pier pilings, May 7 - Oct. 30, 1960.
- Clytia fragilis Congdon, 1907. MW, York River Vepco Plant. October.
- Obelia geniculata (L., 1758). WGH, New Point Comfort, on Zostera.
- Campanularia gelatinosa (Pallas). Eel grass near shore, Gloucester Point, July 1960, MW.
- Gonothyrea sp. RM-A, on VIMS pier pilings Nov. 10, 1959 - May 21, 1960; reproducing Jan. 22 - May 21, 1960.

Campanulinidae

- Lovenella gracilis Clarke, 1882. RPC, Fort Wool.

Plumularidae

- Plumularia diaphana (Heller, 1868). WGH, abundant on Halichondria. RM-A, probably this species on VIMS pier pilings, May 7 - Nov. 28, 1960; gonophores not found.
- Schizotricha tenella (Verrill, 1874). WGH, at TML on floating algae. Dale Calder, Pier 12, Norfolk, on fouling plates June 15 - July 15, 1964.

Sertulariidae

- Thuiaria cupressina (L., 1758). MW, lower bay, abundant, to 15 o/oo.
- Sertularia stookeyi Nutting, 1904. WGH, on Zostera.

Halecidae

- Halecium beani (Johnston, 1847). WGH, Hampton Bar.

Order Siphonophora

Suborder Cystonectae

Rhizophysaliidae

- Physalia physalis (L., 1758). WGH, Virginia Beach, August, 1962.

Suborder Disconectae

Chondrophoridae

- Porpita linnaena Lesson. WGH, on beach at Sand Bridge.

Class Scyphozoa

Order Semaestomeae

Pelagiidae

Chrysaora quinquecirrha (Desor, 1848). White and red phases in brackish water from June to October, extremely abundant in 1962 until August.

Ulmaridae

Aurelia aurita (L., 1758). WGH, very abundant during summer of 1962.

Cyanidae

Cyanea capillata (L., 1758). Common at Gloucester Point in winter.

Order Rhizostomeae

Rhizostomidae

Rhopilema verrilli (Fewkes, 1887). JDA, Sarah's Creek, October 24, Gloucester Point, December 31.

Class Anthozoa

Subclass Alcyonaria

Order Gorgonacea

Gorgoniidae

Leptogorgia virgulata (Lamarck, 1815). MW, whip coral common to Y-10 (15 o/oo). Colonies in York River, purple, much-branched, short; in bay near mouth, colonies yellow or tan with long, whip-like branches.

Subclass Zoantharia (Members of the first two orders have been determined from this area by Charles E. Cutress, U. S. National Museum.)

Order Actinaria

Edwardsiidae

Edwardsia leidy Verrill, 1898. MW, small, abundant in sandy-mud bottom with medium salinity, 0-105 feet; to 400/m² at Y-5.

Nematostella vectensis Stephenson, 1935. Common in Machodoc Creek in silt bottom.

Ilyanthidae

Haloclava producta (Stimpson, 1856). Specimen taken in York River channel off Yorktown.

Actinostolidae

Paranthus rapiformis (LeSueur, 1817). Taken west of Cape Charles City, Virginia.

Diadumenidae

Diadumene leucolena (Verrill, 1866). Common green-brown anemone above low water line on pilings.

Aiptasiidae

Aiptasia eruptaurantia (Field, 1949). York River.

Aiptasiomorphidae

Aiptasiomorpha lucise (Verrill, 1897). WGH, dark, yellow-striped anemone abundant on pilings and shells.

Order Cerianthidea

Cerianthidae

Ceriantheopsis americanus (Verrill, 1894). In mud bottom at depths of 20-70 feet.

Order Madreporaria

Astraeidae

Astrangia danae Agassiz, 1847. RPC, mouth of Chesapeake Bay, scarce. PC, Hog Island Bay, ES, common, winter, 1964.

PHYLUM CTENOPHORA

Class Tentaculata

Order Cydippida

Pleurobrachia pileus (Fabricius, 1780). MW, very abundant York River to Poropotank in late fall.

Order Lobata

Mnemiopsis leidyi A. Agassiz, 1865. MW, common to abundant in York River through much of year.

Class Nuda

Order Beroidea

Beroe ovata Chamisso and Eysenhardt, 1821. MW, frequently taken in fall months.

PHYLUM PLATYHELMINTHES

Class Turbellaria

Order Tricladida

Family Bdellouridae

Bdelloura candida (Girard, 1850). MW, commensal on
Limulus.

Order Polycladida

Family Planoceridae

Coronadena mutabilis (Verrill, 1873). Adrian Lawler,
numerous specimens from VIMS pier. James R., pier 12.
Stylochus ellipticus (Girard, 1850). MLW, 1-100 ft., to
340/sq.m.

Family Leptoplanidae

Leptoplana angusta. MLW, on eel grass.

Class Trematoda (contributed by William J. Hargis, Jr.)

Order Monogenea

Suborder Monopisthocotylea

Superfamily Capsaloidea

Family Monoctylidae

Subfamily Monocotylinae

Monocotyle pricei Pearse, 1949.

(on gills of Dasyatis say)

Monocotyle diademalis Hargis, 1955.

(on gills of Dasyatis americana and D. say)

Subfamily Loimoinae

Loimopapillosum dasyatis Hargis, 1955.

(on gills of Dasyatis say)

Subfamily Merizocotylinae

Empruthotrema raiiae (MacCallum, 1916).

(on gills of Raja eglanteria)

Family Capsalidae

Subfamily Benedeniinae

Benedenia posterocolpa Hargis, 1955.

(ventral surface of Rhinoptera quadriloba)

Suborder Polyopisthocotylea

Superfamily Diclidolphoroidea

Family Discocotylidae

Subfamily Anthocotylinae

Tagia bairdiella Hargis, 1956.

(on gills of Bairdiella chrysur)

Bicotylophora trachinoti (MacCallum, 1822). Price, 1936.

(on gills of Trachinotus carolinus)

Family Diclidophoridae

Subfamily Choricotylinae

Choricotyle cynoscioni (MacCallum, 1917). Llewellyn, 1941.

(on gills of Cynoscion regalis, reported by Frayne in
1943 as C. reynoldsi and C. cynoscioni)

Family Mazocraeidae

Clupeocotyle brevoortia Hargis, 1955.

(on gills of Brevoortia tyrannus)

Mazocraeoides georgei Price, 1936.

(on gills of Brevoortia tyrannus)

Family Microcotylidae

Subfamily Microcotylinae

Microcotylinae poronoti MacCallum, 1916.

(on gills of Poronotus triacanthus)

Microcotyle peprili Pearse, 1949.

(on gills of Peprilus alepidotus)

Microcotyle pomatomi Goto, 1900.

(on gills of Pomatomus saltatrix)

Microcotyle stenotomii Goto, 1899.

(on gills of Stenotomus chrysops)

Subfamily Axininae

Axinoides gracilis (Linton, 1940). Sproston, 1946.

(on gills of Tylosurus marinus)

Superfamily Diclidolphoidea

Family Gastrocotylidae

Subfamily Gastrocotylinae

Scombercotyle scomberomori (Koratha, 1955). Hargis, 1956. (on gills of Scomberomorus maculatus)

Pseudaxine mexicana Meserve, 1938.

(on gills of Scomberomorus maculatus)

Lithidocotyle acanthophallus (MacCallum and MacCallum, 1913). Sproston, 1946. (on gills of Scomberomorus maculatus, also on gills of Pomatomus saltatrix, an unusual host)

Thoracocotyle crocea MacCallum, 1913.

(on gills of Scomberomorus maculatus)

Order Digenea

Family Bucephalidae

Bucephalus cuculus McCrady, 1874. (Sporocysts and cercariae in Crassostrea virginica collected in Wicomico River)

Rhipidocotyle lintoni Hopkins, 1954. (adults in Tylosurus marinus; metacercariae in Menidia)

Rhipidocotyle transversale Chandler, 1934. (adults in Tylosurus marinus; metacercariae in Menidia)

PHYLUM RHYNCHOCOELA

(Members of this group have been determined by William E. McCaul.)

Class Anopla

Order Paleonemertini

Tubulanidae

Tubulanus pellucidus (Coe, 1895). Usually among bryozoans, tunicates and algae.

Carinomidae

Carinoma tremaphoros Thompson, 1900. Dredged from 13 m. or below.

Carinomella lactea Coe, 1905. Occasionally abundant at depths of 10 m. and deeper.

Order Heteronemertini

Lineidae

Cerebratulus lacteus (Leidy, 1851). Taken down to at least 10 m.; more common in intertidal sand.

C. luridus Verrill, 1873. York River and lower bay; 8 m. and below; clayey-silt.

Lineus bicolor Verrill, 1892. York River, rare, mud bottom.

L. pallidus Verrill, 1879. ES, Burton's Bay, silty-clay, one specimen.

L. socialis (Leidy, 1855). Yorktown, York River, subtidal sand, rare.

Micrura leidyi (Verrill, 1892). Abundant, intertidal fine sand, above 15 o/oo.

M. rubra Verrill, 1892. Specimen from Chesapeake Bay off Rapp. R., 15 m.

Parapolia aurantiaca Coe, 1895. ES, Hog Island Bay, sand-silt.

Zygeupolia rubens (Coe, 1895). ES and lower bay, sand, intertidal to 18 m.

Class Enopla

Order Hoplonemertini

Carcinonemertidae

Carcinonemertes carcinophila (Kölliker, 1845). Commensal of Callinectes.

Prosorochmidae

Oerstedtia dorsalis (Abildgaard, 1806). Scarce on eel grass, GP; sandy-silt, 20 m. Chesapeake Bay off Rapp. R.

Amphiporidae

Amphiporus bioculatus (McIntosh, 1873). Sporadically common in sandy-silt, 1-30 m., above 16 o/oo.

A. caecus Verrill, 1892. One specimen, coarse sand, 6 m., Chesapeake Bay off Rapp. River.

A. ochraceus Verrill, 1873. Common on Zostera, GP.

A. rubropunctus McCaul, 1963. On Zostera, scarce, York River.

Tetrastemmatidae

Tetrastemma candidum (Müller, 1774). Common on Zostera.

T. elegans (Girard, 1852). On Zostera, most abundant nemertean, GP.

T. jeani McCaul, 1963. Four specimens on Zostera, 15 o/oo.

T. vermiculus (Quatrefages, 1846). Scarce on Zostera, York River.

Order Bdellonemertini

Malacobdellidae

Malacobdella grossa (Müller, 1776). Commensal in mantle cavity of lamellibranchs, especially Mercenaria.

PHYLUM ENTOPROCTA

Pedicellinidae

Pedicellina cernua (Pallas, 1771). RCO, scarce in lower bay above 15 o/co. Abundant in Chincoteague Bay. WGH, abundant at Wormley Rock. FJSM, Hog Island Bay, ES.

Barentsia discreta (Busk, 1886). RCO, near mouth of Chesapeake.

B. laxa (Kirkpatrick, 1890). RCO, common in Chincoteague Bay. FJSM, Hog Island Bay.

B. gracilis (Sars, 1835). RCO, small colony doubtfully reported.

PHYLUM ECTOPROCTA

Order Cyclostomata

Crisiidae

Crisia eburnea (L., 1758). RCO, above 18 o/oo in lower bay.

Order Ctenostomata

Alcyonidiidae

Alcyonidium parasiticum (Fleming, 1828). RCO, 15 o/oo and above, below mouth of Potomac to mouth of bay, rare. WGH, Wormley Rock.

- A. polyoum (Hassall, 1841). RCO, above 20 o/oo, on shells, larger algae and crab shells.
A. verrilli Osburn, 1912. RCO, above 13 o/oo. MW, usually abundant in winter above 20 o/oo, especially on crab dredging area.

Nolellidae

- Nolella stipata Gosse, 1855. RCO, single record from Chincoteague Bay. WGH, on Zostera in August, GP.
Victorella pavidata Kent, 1870. RCO, at 3-27 o/oo, optimum about 14 o/oo, abundant in summer.
Anguinella palmata Van Beneden, 1844. RCO, above 13 o/oo. WGH, on sponges and Molgula, GP.

Vesiculariidae

- Amathia convoluta Lamouroux, 1816. RCO, lower bay above 22 o/oo, WGH, 50 feet, TML.
A. vidovici (Heller, 1867). RCO, above 11 o/oo. FJSM, lower James, Norfolk.
Bowerbankia gracilis Leidy, 1855. RCO, above 10 o/oo.

Valkeriidae

- Aeverrillia armata (Verrill, 1874). RCO, above 12 o/oo. FJSM, Hog Island Bay, ES. MW, on Libinia dubia, Hampton Roads.

Triticellidae

- Triticella elongata (Osburn, 1912). RCO, commensal in gill chambers of crabs and externally on crabs commensal with Chaetopterus.

Order Cheilostomata

Aeteidae

- Aetea anguina (L., 1758). RCO, rare at TML.

Membraniporidae

- Membranipora membranacea (L., 1766). RCO, scarce, only on Ruppia, 6-13 o/oo.
M. tenuis Desor, 1848. RCO, abundant above 6 o/oo in shallow water.
M. tuberculata (Bosc, 1802). RCO, on Sargassum.
Conopeum truitti Osburn, 1944. RCO, encrusting Ruppia.

Electrinidae

- Electra crustulenta (Pallas, 1766). RCO, 6-32 o/oo, most abundant bryozoan in shallow waters of bay from Baltimore to near mouth. Serious oyster competitor.
E. hastingsae Marcus, 1938. RCO, scarce on shells in lower bay and Chincoteague Bay.
E. pilosa (L., 1766). RCO, above 11 o/oo, scarce.
Cupuladria canariensis Busk, 1859. WGH, 30 feet, York Spit.

Bicellariellidae

Bugula turrita Desor, 1848. RCO, lower bay, above 20 o/oo.

Hippothoidae

Hippothoa hyalina (L., 1767). RCO, common in lower bay, occasional to mouth of Patuxent, 11 o/oo.

Schizoporellidae

Schizoporella unicornis (Johnston, 1847). RCO, common at bay mouth, less so to 18 o/oo. MW, on oyster shell, GP.

Microporellidae

Microporella ciliata (Pallas, 1766). RCO, mouth of bay to 20 o/oo.

PHYLUM PHORONIDEA

Phoronis architecta Andrews. MW, common in silty sand and fine sand to 60 feet. Numbers to 90/sq.m. at 15 feet and 18 o/oo.

PHYLUM ANNELIDA

Class Archianellida

Dinophilidae

Dinophilus gyrociliatus O. Schmidt. Found swarming over dead fish in aquarium by John L. Wood, February 1961.

D. jagersteni Jones and Ferguson, 1957. Shallow waters of brackish swamps and creeks at Norfolk (see references).

Class Polychaeta (families listed alphabetically)

Ampharetidae

Asabellides oculata (Webster, 1879). MW, off Rapp. River; York River above 15 o/oo; sandy silt, 20-50 feet, to 300/sq.m.

Hypaniola grayi Pettibone, 1953. Frequent in Machodoc Creek. Taken in York River above bridge.

Melinna maculata Webster, 1879. MW, Zostera beds through Clymenella community; scarce in deeper water to 87 feet.

Amphinomidae

Pseudeurythoe paucibranchiata Fauvel, 1932. MP, MW, evenly dispersed in silt-clay of York River and Chesapeake Bay, above 15 o/oo, 20-105 feet; to 200/sq.m.

Arabellidae

Arabella iricolor (Montagu, 1804). OH, MW, sporadic in mud-shell areas of lower York River at 20-30 feet, above 15 o/oo.

Drilonereis filum (Claparede, 1868). MW, abundant in intertidal fine sand, GP.

Arenicolidae

Arenicola cristata Stimpson, 1856. MW, intertidal sand, GP, scarce.

Capitellidae

Capitella capitata (Fabricius, 1780). MW, Chesapeake Bay above 20 o/oo, scarce.

Heteromastus filiformis (Claparede, 1864). MW, plentiful, GP, silty sand. VEPCO plant, York River, 400/sq.m.

Notomastus latericius Sars, 1851. MW, common in York River at medium salinities.

Chaetopteridae

Chaetopterus variopedatus (Renier, 1804). MW, occasional to abundant below 25 feet in silt-clay of York River and Chesapeake Bay above 20 o/oo.

Spiochaetopterus oculatus Webster, 1879. MW, abundant, intertidal sand, scarce subtidally; to 200/sq.m.

Chrysopetalidae

Paleanotus heteroseta Hartman, 1945. MW, fine sand, lower bay and York River, above 20 o/oo.

Cirratulidae

Cirriformia filigera (delle Chiaje, 1828). WGH, MW, common to abundant in silty sand to clay-silt, to 750/sq.m., York River and Chesapeake Bay, Clymenella community and deeper, above 20 o/oo.

Cossura sp. HP, York Spit channel, silt.

Tharyx setigera Hartman, 1945. MW, occasionally common at GP, fine sand.

Dorvilleidae

Stauronereis rudolphii (delle Chiaje, 1828). MW, one specimen, GP, fine sand, 15 feet.

Eunicidae

Marphysa sanguinea (Montagu, 1815). MW, single specimen found dead in drift, GP, December, local habitat unknown. Frequent, ES.

Glyceridae

Glycera americana Leidy, 1855. OH, MW, scarce in intertidal and through Clymenella community.

- G. dibranchiata Ehlers, 1868. OH, MW, silty substrates, plentiful, larger in deeper water, above 15 o/oo.
G. robusta Ehlers, 1868. Chincoteague Bay area (Pettibone, 1963).

Goniadidae

- Glycinde solitaria (Webster, 1879). MW, common in sand, above 15 o/oo.

Hesionidae

- Amphidura sp. MP, MW, Rappahannock Shoals Channel, lower bay, 40 feet, silt-clay.
Gyptis vittata (Webster and Benedict, 1887). MW, scarce, 10-40 feet, silty sand to silt-clay.
Podarke obscura Verrill, 1873. MP, MW, sponges and Zostera beds, detritus, GP.

Lumbrineridae

- Lumbrineris tenuis (Verrill, 1873). MW, intertidal to 10 feet, GP, sand, plentiful. Abundant, ES.

Lysaretidae

- Lysarete brasiliensis Kinberg, 1865. MP, several specimens taken on the beach at Virginia Beach after tidal storm in March 1962.

Maldanidae

- Clymenella torquata (Leidy, 1855). MW, sand, to 400/sq.m., 5-85 feet (rare below 30 feet), above 15 o/oo.
C. zonalis (Verrill, 1874). MW, lower Chesapeake Bay to Rappahannock River level, to 80/sq.m., 60-85 feet. Common, ES. (formerly Euclymene collaris, see Mangum, 1962).
Maldanopsis elongata (Verrill, 1873). MW, clay-silt, 25-90 feet, York River and Chesapeake Bay, above 15 o/oo, common.

Nephtyidae

- Aglaophamus verrilli (McIntosh, 1885). MP, MW, fine sand, 20-40 feet, above 15 o/oo.
Nephtys incisa (Malmgren, 1865). MP, MW, to 750/sq.m., Chesapeake Bay and York River, 25-105 feet, above 10 o/oo.
N. magellanica (Augener, 1912). MP, MW, York River and Chesapeake Bay, silty sand to fine sand, to 180/sq.m., 15-87 feet, above 18 o/oo.
N. picta (Ehlers, 1868). MP, MW, common at 10 feet in lower York, scarce off Rappahannock River to common at mouth of bay, sand, 15-40 feet.

Nereidae

- Ceratonereis irritabilis (Webster, 1879). MW, common Hog Island Bay, ES.
- Laeonereis culveri (Webster, 1879). OH, MW, intertidal, abundant in fine sand of York River and tributary creeks, 5-20 o/oo.
- Lycastopsis pontica (Bobretzky, 1872). Norfolk. (Pettibone, 1963).
- Nereis arenaceodonta Moore, 1903. MW, Chesapeake Bay off Rapp. River; James River, silt-clay, rare.
- N. succinea (Frey and Leuckart, 1847). OH, MW, ubiquitous estuarine species, abundant in eel grass, sponges, oyster rocks and detritus-covered bottom. Swarms in May. Probably most widely distributed species in Chesapeake system.
- N. grayi Pettibone, 1956. MP, MW, Chesapeake Bay off Rapp. River, sandy silt, 40 feet, rare.
- Platynereis dumerilii (Audouin and Milne Edwards, 1833). OH, MW, abundant on eel grass, less so in detritus; intertidal to 10 feet, 15-25 o/oo.

Onuphidae

- Diopatra cuprea (Bosc, 1802). OH, MW, frequent GP, abundant ES, intertidal - 30 feet.

Opheliidae

- Ophelia bicornis (Savigny, 1818). MW, Chesapeake Bay off Rapp. River, sand, local and gregarious, rare.
- Travisia carnea (Verrill, 1873). MW, off Rapp. River, off ES, sand, scarce.

Orbiniidae

- Scoloplos fragilis (Verrill, 1873). MW, intertidal to 15 feet, sand; common, GP, above 10 o/oo.

Paraonidae

- Aricidea sp. MP, MW, Hampton Bar, minute form.

Pectinariidae

- Pectinaria gouldii (Verrill, 1873). OH, MW, sand to silty clay, subtidal to 100 feet, above 15 o/oo; over 30,000 juv./sq.m. in Tangier Sound, July 1962, 87 feet.

Phyllodocidae

- Eteone lactea Claparède, 1868. MW, silt-clay, Sarah's Creek, Chesapeake Bay off Rapp. River, 10-84 feet, to 150/sq.m.
- E. heteropoda Hartman, 1951. MP, part of material identified as Paranaitis speciosa by Treadwell (Cowles, 1930). MW, common subtidally, York River, above 18 o/oo.

Nereiphylla fragilis (Webster, 1879). MW, associated with oysters, common. Abundant Franklin City, ES, 23-35 o/oo, George Griffith.

Paranaitis speciosa (Webster, 1870). MP, MW, mud-detritus, Sarah's Creek.

Phyllodoce arenae Webster, 1879. MW, plentiful, sand, 10-20 feet, above 20 o/oo.

P. mucosa Oersted, 1843. MW, rare, lower bay, sand.

Pilargiidae

Ancistrosyllis bassi Hartman, 1945. MP, MW, Chesapeake Bay, York River, above 20 o/oo, silty sand, 0-30 feet, common.

Polynoidae

Harmothoe acanellae Verrill, 1881. Chesapeake Bay (Pettibone, 1963). Evidently associated with Leptogorgia.

H. extenuata (Grube, 1840). MP, MW, York River and Chesapeake Bay, above 20 o/oo, scarce, 15-87 feet.

H. sp. MP, MW, common York River, silty sand to silt-clay, above 15 o/oo, to 60/sq.m., light red species.

Lepidometria commensalis Webster, 1879. OH, MW, scarce, commensal with Amphitrite and Loimia.

Lepidonotus sublevis Verrill, 1873. MP, MW, lower bay to 15 o/oo, or less, sand to sandy silt, 0-87 feet, common, especially near mouth of bay.

L. variabilis Webster, 1879. MP, specimen from ES.

Sabellaridae

Sabellaria vulgaris Verrill, 1873. OH, MW, hard substrates, usually oyster shell, on sand, Y-0, 25 feet, scarce.

Sabellidae

Fabricia sabella (Ehrenberg, 1837). WGH, on Libinia, Y-0, July.

Potomilla neglecta (Sars, 1851). MW, silt-clay, GP, 30 feet, rare.

Sabella microphthalmia Verrill, 1873. OH, MW, abundant in Zostera beds, on sponges, GP, 0-20 feet, above 15 o/oo.

Serpulidae

Hydroides hexagona (Bosc, 1802). MP, MW, abundant on hard substrates, above 15 o/oo. (formerly Eupomatus)

Sigalionidae

Sthenelais boa (Johnston, 1839). MP, MW, Chesapeake Bay and York River above 18 o/oo, sandy-silt, scarce.

S. limicola (Ehlers, 1864). MW, Wachapreague, oyster ground.

Spionidae

- Polydora commensalis Andrews, 1891. MW, found in shell with female Pagurus longicarpus, among egg mass, by Morris Roberts, May 25, 1965, GP.
- P. ligni Webster, 1879. OH, MW, probably most abundant polychaete in Chesapeake Bay, larvae usually outnumber those of all other polychaetes in plankton. Mud tubes, often large colonies, on any stable substrate.
- P. websteri Hartman, 1943. MW, abundant in shells of living oysters.
- Prionospio heterobranchia Moore, 1907. MP, MW, Zostera beds, Y-5, rare; VEPCO area, Y-5, fine sand, scarce.
- Paraprionospio pinnata (Ehlers, 1901). MP, MW, scarce to abundant, sand-silt, above 12 o/oo; 600/sq.m., VEPCO area, York River, January.
- Scolecopides viridis (Verrill, 1873). MP, MW, euryhaline, most abundant below 15 o/oo, to 400/sq.m., fine sand, detritus, intertidal, 50 feet.
- Scolelepis bousfieldi Pettibone, 1963. MW, abundant, Chesapeake Bay off Rapp, River, 0.5 mm screen, silt, 10-40 feet.
- Spio filicornis (O. F. Muller, 1766). MW, common, Chesapeake Bay off Rapp, River.
- S. setosa (Verrill, 1873). MP, common, intertidal, GP.
- Spiophanes bombyx (Claparede, 1870). MW, intertidal and Zostera beds, abundant in sand, GP; 300/sq.m., VEPCO area, Y-5, scarce.
- Streblospio benedicti Webster, 1879. MW, creeks, silt, 5-15 o/oo, to 600/sq.m.

Syllidae

- Autolytus cornutus A. Agassiz, 1863. MP, lower bay.
- A. prolifer (Müller, 1788). MP, lower bay.
- Brania clavata (Claparède, 1863). MW, off Hampton, 25 feet, 0.5 mm screen, public landing, Maryland (Pettibone, 1963).
- B. wellfleetensis Pettibone, 1956. MW, Rappahannock Shoals Channel, Chesapeake Bay, 0.5 mm screen, 40 feet.
- Exogone dispar (Webster, 1879). MP, MW, silt-clay, 30 feet, GP.
- Parapionosyllis manca (Treadwell, 1931). MP.
- P. longicirrata (Webster and Benedict, 1884). MW, specimen taken in bottle trap, GP.

Terebellidae

- Amphitrite ornata (Leidy, 1855). MW, intertidal, Zostera beds, less common at greater depths, above 15 o/oo.
Enoplobranchus sanguineus (Verrill, 1873). MW, apparently confined to Zostera beds (abundant) and intertidal.
Loimia medusa (Savigny, 1818). MW, sandy silt to silt-clay, abundant, above 10 o/oo, 5-80 feet.
Lysilla alba (Webster, 1879). MW, Zostera bed, GP, rare.
Pista cristata (Müller, 1776). MW, Chesapeake Bay off Rapp. River, rare.
P. maculata (Dalyell, 1853). MW, Chesapeake Bay off Rapp. River, rare.
P. palmata (Verrill, 1873). OH, MW, Zostera bed, GP, scarce.
Polycirrus eximius (Leidy, 1855). WGH, MW, sand, shell, common, somewhat colonial, 200/sq.m., lower bay.

Class Oligochaeta

- Pontodrilus bermudensis. Reported by Richards (1931). Cape Charles, sand above intertidal. Apparently identified by J. Percy Moore.

Class Hirudinea

Ichthyobdellidae

- Myzobdella lugubris Leidy, 1851. WVE, taken from blue crabs at Tangier and York River, rare.
Ichthyobdella funduli Verrill, 1872. MW, found swimming free, GP.
I. rapax (Verrill, 1873). Collected from Palaemonetes pugio by William McCaul, 1963, GP, Zostera.
Piscicola punctata (Verrill). JPM (from Cowle's survey).
Trachelobdella vividus (Verrill, 1872). MW, one specimen taken swimming free by Robert Black, February 1961, GP beach.

PHYLUM SIPUNCULOIDEA

- Golfingia gouldi (Pourtalès, 1851). MW, four specimens taken at Virginia Beach after storm tides, March 1962.

PHYLUM MOLLUSCA

Class Pelecypoda

Order Palaeoconcha

Solemyidae

Solemya velum Say, 1822. JDA, MW, scarce to common, Zostera beds, sand, 15-25 o/oo.

Order Protobranchia

Nuculidae

Nucula proxima Say, 1822. JDA, MW, Chesapeake Bay off Rappahannock River, fine sand to silty sand, scarce to 675/sq.m., above 20 o/oo. Scarce, lower York and James rivers.

Nuculanidae

Yoldia limatula (Say, 1831). JDA, MW, lower bay, to 1500/sq.m. Rare, GP, 30 feet. Rare, lower James River.

Order Filibranchia

Arcidae

Anadara transversa (Say, 1822). JDA, MW, Chesapeake Bay off Rappahannock River, York River, common, to 400/sq.m. as small epifauna.

A. ovalis (Bruguière, 1792). JDA, lower bay, common.

Noetia ponderosa (Say, 1822). WGH, common, ES.

Mytilidae

Volsella demissa (Dillwyn, 1817). JDA, Spartina marsh, euryhaline, abundant. Reportedly decreased (ES) recently.

Brachidontes recurvus (Rafinesque, 1820). JDA, oyster rocks, abundant, euryhaline.

Amygdalum papyria (Conrad, 1846). JDA, Zostera beds, euryhaline, scarce.

Mytilus edulis L., 1758. JDA, lower bay, sporadic, rare to abundant, setting in winter. Abundant all seasons on pilings of bridge-tunnel system at bay mouth.

Pectinidae

Aequipecten irradians (Lamarck, 1819). JDA, reportedly abundant on Eastern Shore before disappearance of eel grass. Now infrequently taken on seaside, ES.

Anomiidae

Anomia simplex Orbigny, 1845. JDA, on oysters and other solid substrates, common, above 10 o/oo.

Ostreidae

Crassostrea virginica (Gmelin, 1792). JDA, range of commercial production now considerably reduced by MSX disease in more saline waters.

Order Eulamellibranchia

Carditidae

Venericardia tridentata Say, 1826. JDA, rare.

Corbiculidae

Polymesoda caroliniana Bosc, 1830. JDA, James River marsh and river bank, intertidal, Jamestown and Mulberry Islands area, 0-15 o/oo. (Andrews and Cook, 1951).

Dreissenidae

Congeria leucophaeata (Conrad, 1831). JDA, MW, on submerged phanerogams and other firm substrates, common below 10 o/oo.

Lucinidae

Lucina multilineata Tuomey and Holmes, 1857. JDA, MW, Chesapeake Bay off Rappahannock River, common, to 450/sq.m. Scarce Y5, 5-30 feet.

Leptonidae

Aligena elevata Stimpson, 1851. JDA, MW, commensal with Clymenella, to 270 sq.m.

Mysella planulata Stimpson, 1857. MW, off Rappahannock River, June 1962.

Cardiidae

Laevicardium mortoni (Conrad, 1830). JDA, MW, Chesapeake Bay below Tangier Island, sand, 30 feet, 90/sq.m. York River, sand near shore, scarce.

Veneridae

Mercenaria mercenaria (L., 1758). JDA, MW, abundant above 10 o/oo.

Dosinia discus Reeve, 1850. MW, York Spit, large recent valves. York River, GP, 2 specimens about 1 inch, fragile shells, 30 feet. Chesapeake Bay, off Rappahannock River, 1 small specimen.

Gemma gemma (Totten, 1834). JDA, MW, sand, 5-25 o/oo, common at Tue Marsh light; patchily common, Chesapeake Bay off Rappahannock River, 450/sq.m., 30 feet; rare Y-25.

Petricolidae

Petricola pholadiformis (Lamarck, 1818). JDA, Paul Chanley, Goodwin Islands, peat, 20-30 o/oo, common intertidal.

Tellinidae

- Tellina agilis Stimpson, 1858. KB, MW, abundant ES, Hampton Bar, York Spit. Common, Yorktown. Above 18 o/oo.
Macoma balthica (L., 1758). JDA, MW, abundant 5-15 o/oo, intertidal, 30 feet, 600/sq.m.
M. phenax Dall, 1900. KB, MW, abundant in brackish creeks, 270/sq.m. Sarah's Creek, GP; Machodoc Creek, silt, 2-20 o/oo.
M. tenta Say, 1834. JDA, MW, lower bay and rivers, 20-30 o/oo, 20-40 feet, silt-clay, habitat apparently not overlapping that of congeners locally.

Semelidae

- Abra aequalis Say, 1822. WGH, Old Plantation Flats, 30 feet, rare.

Donacidae

- Donax variabilis Say, 1822. JDA, ocean beaches with surf, intertidal, fluctuating populations.

Sanguinolariidae

- Tagelus plebeius (Solander, 1786). JDA, abundant GP, 0-5 feet, fine sand to silty sand, above 10 o/oo.
T. divisus (Spengler, 1794). JDA, MW, mouth of bay, sand, scarce. Hog Island Bay, ES, abundant.

Solenidae

- Ensis directus Conrad, 1843. JDA, MW, abundant ES, variable elsewhere above 20 o/oo, 5-50 feet. Over 30,000 juveniles/sq.m. in Chesapeake Bay off Rappahannock River, June 1962. Larger specimens (1 inch) identified as this species by Dr. William J. Clench, MCZ.
Solen viridus Say, 1821. Paul Chanley, Cedar Is., ES, plentiful.

Mactridae

- Spisula solidissima (Dillwyn, 1817). JDA, offshore, numbers unknown. Washed ashore by severe storms.
Mulinia lateralis (Say, 1822). JDA, MW, above 8 o/oo, peak populations in silt areas but low reservoir populations apparently in nearshore sand, to 22,000/sq.m., Tangier Sound.
Rangia cuneata (Gray, 1831). WGH, found near N. C. line, 1960. John Shidler, several larger specimens from James River, March 1963. Abundant in Back Bay, 1962, James Kerwin, F. & W. S.

Myacidae

Mya arenaria (L., 1758). JDA, MW, abundant above 10 o/co, sand to silty sand, 0-25 feet, breeding in spring and fall, juvenile to 1,000/sq.m.

Pholadidae

Cyrtopleura costata (L., 1758). JDA, MW, common in silt-clay near shore, above 10 o/co.

Barnea truncata (Say, 1822). JDA, Paul Chanley, Goodwin Islands, peat, abundant.

Diplothyra smithii (Tryon, 1862). JDA, rare, boring in wood.

Martesia cuneiformis (Say, 1822). JDA.

Teredinidae

Bankia gouldi Bartsch, 1980. JDA, MW, setting May to October, GP, abundant. See Scheltema and Truitt, 1954.

Teredo navalis L., 1758. Identified from VIMS test panels, GP, by Clapp Laboratories, common.

Lyonsiidae

Lyonsia hyalina Conrad, 1831. JDA, MW, Chesapeake Bay off Rappahannock River, fine sand to sandy silt, to 1200/sq.m.

Pandoridae

Pandora trilineata Say, 1822. JDA, MW, Chesapeake Bay off Rappahannock River, sand, rare (patchily dist.), to 100/sq.m.

Order Septibranchia

Cuspidariidae

Cardiomya glypta Bush, 1878. MW, Chesapeake Bay, off Rappahannock River, Wolftrap, silt-clay, scarce, to 45/sq.m.; GP, 30 feet, one specimen.

Class Gastropoda

Subclass Prosobranchia

Order Archaeogastropoda

Fissurellidae

Diodora cayenensis (Lamarck, 1822). WGH, rare, ES.

Order Mesogastropoda

Littorinidae

Littorina irrorata (Say, 1822). JDA, Spartina marshes, intertidal.

Vitrinellidae

Teinostoma cryptospira Verrill, 1884. DM, MW, York River, 30-60 feet, rare.

Caecidae

Caecum pulchellum Stimpson, 1851. MW, Chesapeake Bay off Rappahannock River, sand, 30 feet, scarce, 60/sq.m.

Cerithiidae

Bittium alternatum (Say, 1822). JDA, MW, Zostera, GP, abundant, in summer, rare beyond eel grass beds.

B. varium Pfeiffer, 1840. JDA, in spite of the antiquity of these two species, their distinctness seems questionable, MW.

Cerithiopsis greeni (C. B. Adams, 1839). MW, rare.

Triphoridae

Triphora nigrccincta C. B. Adams, 1839. JDA, MW, Zostera, scarce to common, GP.

Epitoniidae

Epitonium multistriatum (Say, 1826). MW, mouth of bay, 30 feet, sand, scarce.

E. rupiculum (Kurtz, 1860). JDA, MW, Zostera bed to 40 feet, common, to 30/sq.m.

Calyptraeidae

Crepidula fornicata (L., 1767). JDA, oyster rocks, common to abundant.

C. convexa Say, 1822. JDA, MW, Zostera, abundant to 1000/sq.m. summer and fall.

C. plana Say, 1822. JDA, MW, on shells and other solid substrates.

Naticidae

Polinices duplicatus Say, 1822. JDA, York Spit, scarce. MW, mouth of bay, common.

Sinum perspectivum Say, 1831. JDA, along outer beaches.

Tectonatica pusilla (Say, 1822). MW, mouth of bay, sand, scarce.

Order Neogastropoda

Muricidae

Eupleura caudata (Say, 1822). JDA, common but less so than Urosalpinx. Larger on ES. Zostera beds and oyster rocks, to 30 feet.

Urosalpinx cinerea (Say, 1822). JDA, common drill above 12-15 o/oo, abundant and much larger on ES.

Thais haemastoma. Subsp. floridana Conrad, 1837, reported ES by Sieling, 1960. Subsp. haysae Clench, 1927, iden. by S. H. Hopkins and J. D. Andrews, ES.

Columbellidae

- Anachis avara (Say, 1822). JDA, MW, rare, above 20 o/oo.
A. translirata Ravenel, 1861. MW, common, to 60/sq.m. off Rappahannock River to mouth of bay; 20-40 feet.
Mitrella lunata (Say, 1826). Common, to 75/sq.m., Zostera beds. Scarce in other habitats to 40 feet.

Melongenidae

- Busycon carica (Gmelin, 1790). JDA, scarce.
B. canaliculatum (L., 1758). JDA, common, lower bay, above 20 o/oo.

Nassariidae

- Nassarius vibex (Say, 1822). JDA, MW, above 5 o/oo, 0-50 feet, abundant in Zostera and Clymenella communities. Often aggregated.
N. trivittatus (Say, 1822). JDA, MW, mouth of bay and ES, to 35 feet, sand, common.
N. obsoletus (Say, 1822). JDA, MW, abundant, not found beyond Zostera beds, mainly confined to eel grass beds in winter, in shallower water later, aggregating toward fall (400/sq.m.). Shells always with longitudinal eroded furrows and epiphytic growth.

Marginellidae

- Marginella denticulata Conrad, 1830. MW, lower bay.

Terebridae

- Terebra dislocata Say, 1822. JDA, mouth of bay, rare.

Turridae

- Mangelia cerina Kurtz and Stimpson, 1851. MW, Kiptopeke, 30 feet, sand, 3 specimens.
M. plicosa C. B. Adams, 1840. JDA, oyster rocks, rare. MW, Zostera and Clymenella communities, common to abundant.

Subclass Opisthobranchia

Order Tectibranchia

Acteonidae

- Acteon punctostriatus C. B. Adams, 1840. JR, MW, abundant soft bottom lower bay, 10-60 feet.

Atyidae

- Haminoea solitaria (Say, 1822). JDA, MW, lower York River, above 15 o/oo, sand, 0-15 feet, to 300/sq.m.

Retusidae

- Retusa canaliculata (Say, 1822). JDA, MW, abundant in silty-sand, 5-15 feet. Decreasing with depth, to 100 feet, Chesapeake Bay off Rappahannock River. Lower York River, to 3000/sq.m., above 15 o/oo.

Scaphandridae

Cylichna alba Brown, 1827. MW, mouth of York River and off Wolftrap, 75 feet, rare.

Pyramidellidae

Odostomia bisuturalis Say, 1821. MW, above 15 o/oo, common, esp. in Clymenella communities, 0-30 feet, to 400/sq.m.

O. impressa Say, 1822. JDA, MW, ectoparasite on oysters and other Bivalves, common on oyster and Zostera beds.

O. dux Dall and Bartsch, 1906. HW, MW, sporadic, scarce, York River, VEPCO area.

Pyramidella candida Morch, 1875. JDA, MW, Chesapeake Bay off Rappahannock River, GP, rare.

P. fusca C. B. Adams, 1839. JR ("cf fusca"), MW, rare, lower bay, York River at Yorktown.

Turbonilla interrupta Totten, 1835. JDA, MW, fine sand, abundant in Clymenella community, 5-30 feet, to 150/sq.m., above 15 o/oo.

T. stricta Verrill, 1874. MW, Chesapeake Bay off Rappahannock River, York River, rare to common.

Order Nudibranchia

Corambidae

Corambella depressa Balch, 1899. JDA, MW, most common nudibranch in lower bay. Occas. abundant on Alcyonidium, also with fouling organisms.

Elysiidae

Elysia catula Gould, 1870. MW, found only on Zostera, except for two on surface film in October.

E. chlorotica Gould, 1870. See Pfitzenmeyer, 1960.

Subclass Pulmonata

Order Basommatophora

Ellobiidae

Melampus bidentatus Say, 1822. JDA, intertidal Spartina marsh, abundant.

Detracia floridana (Pfieffer, 1856). JDA, intertidal marsh.

Class Amphineura

Order Chitonida

Ischnochitonidae

Chaetopleura apiculata (Say, 1830). WGH, Hog Island, ES, oyster bed.

Class Cephalopoda

Order Decapoda

Lolliguncula brevis Blainville. MW, mouth of bay, occasionally common.

PHYLUM ARTHROPODA

Class Merostomata

Xiphosura polyphemus (L., 1758). MW, taken frequently in lower bay, occasional to Indian Creek above Rappahannock River.

Class Pycnogonida

Anoplodactylus parvus Giltay, 1934. JWH, off Plantation Point, off Rappahannock Spit.
A. pygmaeus (Hodge, 1864). JWH, Norfolk; August; MW, VEPCO intake, York River, October.
Callipallene brevirostris (Johnston, 1837). JWH, off Sandy Point, off Thimble Rock. MW, common on hydroids in York River.
Endeis spinosa (Montagu, 1808). JWH, off Plantation Point, pelagic Sargassum inhabitant.
Tanystylum orbiculare Wilson, 1878. JWH, off Wolf Trap and New Point Comfort. MW, on Molgula and sponges, Gloucester Point.

Class Arachnida

Order Acari (Solomons Island, Maryland, Newell, 1947)

Rhombognathus magnirostris Trouessart, 1889.

Halocarus anomalus Trouessart, 1894.

Agauopsis borealis Newell, 1947.

Class Crustacea

Subclass Branchiopoda

Order Diplostraca

Suborder Cladocera

Sididae

Penilia avirostris Dana. One mile inside mouth of bay, iden. by Della-Croce, reported by Frank J. Schwarz (pers. comm.). MW, occasionally abundant in "Pathfinder" plankton collections offshore.

Leptodoridae

Leptodora kindti (Focke). MW, often very abundant, Pamunkey River, spring.

Subclass Ostracoda

Order Myodocopa

Cylindroleberididae

Cylindroleberis mariae (Baird, 1850). MW, in fauna, abundant in subtidal sand, GP, Yorktown.

Sarsiellidae

- Sarsiella texana Kornicker and Wise, 1962. MW, silt-clay, 30 feet, GP, to 30/sq.m.
S. zostericola Cushman, 1906. MW, found with S. texana, 5 to 10 times as abundant.

Order Podocopa

Cytheridae

- Cyprideis beaveni Tressler and Smith, 1948. WLT, Patuxent River and Mill Creek, 1-3 feet, weeds and detritus.
C. littoralis (Brady, 1869). WLT, spring and summer, SI, in plant growth.
Cythere sclerochilus Tressler and Smith, 1948. WLT, all year, SI, intertidal sand.
C. triangularis Tressler and Smith, 1948. WLT, November, SI, June, Tar Bay, soft bottom, scarce.
Cytheridea papillosa (Bosquet, 1852). WLT, spring and summer, SI.
C. punctillata (Brady, 1865). WLT, all year, SI, abundant.
Cytheromorpha fuscata (Brady, 1869). WLT, common, SI, winter.
Cytherura gibba (O. F. Müller, 1785). WLT, common, summer, SI.
Hemicythere strandentia Tressler and Smith, 1948. WLT, June, intertidal, SI.
H. truitti Tressler and Smith, 1948. WLT, 15 feet, sand, all year, SI.
Leptocythere macallana (Brady and Roberts, 1869). WLT, all year, SI.
Sarsocythere patuxiensis Tressler and Smith, 1948. WLT, July, 15 feet, weeds, SI.

Loxochonchidae

- Loxoconcha impressa (Baird, 1850). WLT, littoral zone, summer and early fall, SI. MW, Zostera bed, GP.

Subclass Copepoda

Order Calanoida

Calanidae

- Calanus finmarchicus (Gunnerus, 1765). GDG, ECT, mouth of bay, winter, common.

Paracalanidae

- Paracalanus crassirostris Dahl. HPJ, scarce, GP.
P. parvus (Claus, 1863). CBW, euryhaline, abundant lower bay, winter; less abundant upper bay, autumn.

Pseudocalanidae

- Pseudocalanus elongatus (Boeck, 1864). CBW, euryhaline, scarce, winter and spring.
P. minutus (Kroyer, 1840). HPJ, rare, GP.

Centropagidae

- Centropages hamatus (Lilljeborg, 1853). CBW, euryhaline, winter and spring, abundant.

Diaptomidae

- Pseudodiaptomus coronatus Williams, 1906. CBW, euryhaline, winter, scarce. HPJ, scarce, GP, summer.

Temoridae

- Temora discaudata Giesbrecht, 1889. CBW, rare, lower bay.
T. longicornis (Muller, 1792). CBW, mouth of bay, rare.
T. turbinata (Dana, 1853). CBW, mouth of bay, abundant, fall and winter.
Eurytemora americana Williams, 1906. CBW, middle and lower bay, winter and spring, scarce.
E. hirundoides (Nordquist, 1888). CBW, middle and upper bay, abundant, HPJ, common GP.

Candaciidae

- Candacia armata (Boeck, 1872). GDG, ECT, abundant lower bay. CBW, Governor's Run, Maryland.

Pontellidae

- Labidocera aestiva Wheeler, 1899. CBW, lower bay, common. HPJ, rare, York River.
L. wollastoni (Lubbock, 1857). CBW, mouth of bay, rare.
Pontella pennata Wilson, 1932. CBW, lower bay, rare.

Acartiidae

- Acartia clausii Giesbrecht, 1892. CBW, scarce, winter. See Bowman, 1961.
A. tonsa Dana, 1849. TEB, euryhaline, most abundant species in area.

Order Harpacticoida

Cletodidae

- Cletodes longicaudatus (Boeck, 1872). CBW, Barren Island, Maryland, 148 feet, (benthic-MW).

Longipediidae

Canuella elongata Wilson, 1932. CBW, Bloody Point, Maryland, rare, (benthic-MW).

Ectinosomidae

Ectinosoma curticorne Boeck, 1872. CBW, euryhaline, abundant.

E. normani T. & A. Scott, 1897. CBW, lower Potomac, "about 30 females," (benthic-MW).

Microsetella norvegica (Boeck, 1864). CBW, mouth of bay, scarce.

Harpacticidae

Harpacticus chelifer (O. F. Muller, 1776). CBW, mouth of bay, 2 females.

H. gracilis Claus, 1863. CBW, euryhaline, winter and spring.

H. littoralis G. O. Sars, 1880. CBW, Barren Island and James Island, Maryland, sporadic.

Peltidiidae

Alteutha depressa Baird, 1850. CBW, lower bay, rare.

Tisbidae

Tisbe furcata (Baird, 1850). CBW, lower bay, sporadic.

Thalestridae

Microthalestris littoralis G. O. Sars, 1911. CBW, euryhaline, scarce.

Dactylopusia brevicornis (Claus, 1866). CBW, Point Lookout, Maryland, 2 specimens.

Diosaccidae

Diosaccus tenuicornis (Claus, 1863). CBW, mouth of bay, one specimen, (benthic-MW).

Tachidiidae

Tachidius littoralis Poppe, 1881. CBW, Love Point, Maryland, rare.

Order Cyclopoida

Oithonidae

Oithona brevicornis Giesbrecht, 1891. CBW, euryhaline, abundant HPJ, York River, common.

O. similis Claus, 1866. CBW, euryhaline, abundant.

O. spinirostris Claus, 1863. CBW, mouth of bay, rare.

Cyclopidae

Cyclops gracilis Lilljeborg, 1853. CBW, Love Point, Maryland, rare.

Metacyclops gracilis (Lilljeborg, 1853). CBW, upper bay, 10 o/oo, freshwater species.

Clausidiidae

Hemicyclops americanus Wilson, 1932. CBW, Barren Island and Bloody Point, rare, benthic.

Oncaeiidae

Oncaea minuta Giesbrecht, 1892. CBW, lower and middle bay, scarce.

O. venusta Phillippi, 1843. CBW, mouth of bay, rare.

Corycaeiidae

Corycaeus elongatus Claus, 1863. CBW, York Spit, scarce.

C. venustus Dana, 1853. CBW, lower bay, scarce, fall and winter.

Corycella carinata Giesbrecht, 1892. CBW, mouth of bay, rare.

Dyspontiidae

Cryptopontius gracilis Wilson, 1932. CBW, 145 feet, Cape Charles City, 6 specimens. MW, abundant on sponges, shallow water, summer; on Microciona, winter.

Ergasilidae

Ergasilus labricis Kroyer, 1863. WGH, James River, on gills of striped bass, Roccus lineatus.

Bomolochidae

Bomolochus eminens Wilson, 1911. CBW, Point No Point, Maryland, fish parasite, local host unknown.

Order Notodelphyoidea

Notodelphyidae

Doropygus laticornis Wilson, 1932. Abundant in atrium of Molgula, GP, July.

Suborder Caligoida

Anthosomatidae

Lernanthropus pomatomi Rathbun, 1887. On Pomatomus saltatrix, David Zwerner.

Caligidae

Caligus chelifers Wilson, 1905. TEB, ECT, oceanic, rare.

C. schistronyx Wilson, 1905. TEB, ECT, lower bay, scarce. CBW, lower bay, parasite on Brevoortia tyrannus.

Lernaeidae

Lernaeenicus radiatus (Le Sueur, 1824). MW, parasitic on skin of menhaden, anchovies and other fish.

Lerneocera centropristi Pearse, 1947. Copepodid larva in Centropristes striatus, David Zwerner.

Subclass Branchiura

Argulus laticauda Smith, 1873. Parasitic on toadfish, Opsanus tau, at Solomon's, Maryland. (Dutcher and Schwartz, 1962). GP, see Hargis, 1958.

Subclass Cirripedia

Order Lepadomorpha

Lepadidae

Octolasmis lowei Darwin, 1854. WVE, parasitic in gill chamber of Callinectes sapidus.

Order Thoracica

Suborder Balanomorpha

Chthamalidae

Chthamalus fragilis Darwin, 1854. JDA, abundant in high intertidal on pilings and Spartina.

Balanidae

Balanus amphitrite Darwin, 1854. JDA, mouth of bay, scarce.

B. eburneus Gould, 1841. JDA, common on pilings in intertidal.

B. galeatus (L.) MW, commensal on Leptogorgia, 2 specimens found, Y5.

B. improvisus Darwin, 1854. JDA, most common barnacle below intertidal.

Chelonibia patula (Ranzani, 1818). WVE, on external carapace of blue crab.

C. testudinaria (L., 1758). WVE, on sea turtles.

Platylepas hexastylus (Fabricius, 1798). WVE, found once, on blue crab from lower bay. Chincoteague Bay, on green turtle (Schwartz, 1960).

Order Rhizocephala

Loxothylacus panopaei (Gissler, 1884). (See Van Engel, et al, 1965.)

Subclass Malacostraca

Order Mysidacea

Mysidae

Neomysis americana (Smith, 1873). MW, abundant in rivers, less so in bay and on ES, euryhaline, perhaps cyclic or sporadic (Hopkins, 1965), all depths, rising off bottom at night.

Mysidopsis bigelowi Tattersall, 1926. G.G., just off mouth of bay. See Hopkins, 1965, for possible additional species.

Order Cumacea

Bodotriidae

Cyclaspis varians Calman, 1912. MW, offshore plankton.
Leptocuma minor Calman, 1912. MW, offshore plankton.

Leuconidae

Leucon americanus Zimmer, 1943. MW, Sarah's Creek, 300/sq.m., rare in York River, 10-30 feet, 10-20 o/oo.

Diastylidae

Diastylus politus Smith, 1879. MW, offshore plankton.
Oxyurostylis smithi Calman, 1912. MW, common to abundant, 600/sq.m., VEPCO area, sand, 5-30 o/oo.

Order Isopoda

Suborder Gnathiidea

Tanaidae

Leptochelia savigny (Kroyer, 1842). MW, intertidal, GP, scarce.

Suborder Anthuridea

Anthuridae

Cyathura polita (Stimpson, 1855). MW, euryhaline, substrates with some sand, freshwater to 20 o/oo.

Suborder Flabellifera

Cymothoidae

Aegathoa oculata (Say, 1818). GG, mouth of bay, plankton tow.

Irona nana Schioedte and Meinert, 1883-84. GG, from gill of Membras martinica, Sand Bridge Beach, Virginia, summer.

Lironeca ovalis (Say, 1818). WGH, gill parasite of bluefish, Pomatomus.

Olencira praegustator (Latrobe, 1802). MW, Sand Bridge, abundant parasite in mouth of menhaden, Brevoortia.

Sphaeromidae

- Ancinus depressus (Say, 1818). WGH, Sand Bridge, MW, off ES, scarce.
Paracerceis caudata (Say, 1818). TEB, specimen collected on ES by Sewell Hopkins.
Sphaeroma destructor Richardson, 1897. TEB, WGH, Urbana, in hull of boat recently arrived from Florida, July 1962.
S. quadridentatum Say, 1818. WGH, under stones, GP. MW, among intertidal barnacles and algae, common.

Suborder Valvifera

Idoteidae

- Chiridotea almyra Bowman, 1955. MW, West Point and lower Pamunkey River, plankton, frequent.
C. coeca (Say, 1818). GG, off Chesapeake Bay, plankton. MW, Pamunkey River, rare.
C. tuftsi (Stimpson, 1853). GG, offshore plankton tow.
Erichsonella attenuata (Harger, 1873). MW, on Zostera, GP, abundant.
E. filiformis (Say, 1818). TEB, collected on ES by Sewell Hopkins, habitat unknown.
Idotea baltica (Pallas, 1772). MW, on Zostera, less abundant than E. attenuata, active swimmer.
I. metallica Bosc, 1802. GG, abundant in offshore plankton.
Edotea triloba (Say, 1818). MW, euryhaline, offshore to Pamunkey River, usually most common in Zostera beds, rare in deeper water but 600/sq.m. found in Tangier Sound at 87 feet.

Suborder Oniscoidea

Ligiidae

- Ligia exotica Roux, 1828. MW, abundant on shaded pilings, GP.

Order Amphipoda

Suborder Gammaridea

Ampeliscidae

- Ampelisca abdita Mills, 1964. See Mills, 1964. Local distribution has not been studied.
A. macrocephala Lilljeborg, 1852. MW, abundant (100/sq.m.) lower York, sand, to 20 feet.
A. vadorum Mills, 1963. MW, York River (300/sq.m.), off Rappahannock River (3000/sq.m.), fine sand, sandy-silt.

Ampithoidae

- Ampithoe longimana Smith, 1873. MW, Y-5 to Y-10, on Ruppia and Zostera, rare.
Cymadusa compta (Smith, 1873). MW, Zostera beds, algae, detritus; abundant, 0-30 feet, 10-20 o/oo.

Aoridae

Lembos smithi (Holmes, 1903). TEB, Eastern Shore.

Bateidae

Atylus minikoi (Walker). CRS, Chesapeake Bay.

Batea catharinensis Muller, 1865. MW, York River, Chesapeake Bay, epifauna on detritus, hydroids, bryozoans and sponges, 10-40 feet, above 10 o/oo, abundant.

Corophiidae

Cerapus tubularis Say, 1817. MW, abundant, 30 feet, silt-clay, GP.

Corophium lacustre Vanhoffen, 1911. MW, lower Pamunkey P-40, 4800/sq.m., 10-40 feet, detritus, 0-10 o/oo.

C. simile Shoemaker, 1934. CRS.

C. tuberculatum Shoemaker, 1934. CRS, MW, common ES.

Erichthonius brasiliensis Dana, 1853. TEB, MW, York River, 15-70 feet, abundant, 400/sq.m., silt-clay.

Unciola irrorata Say, 1818. MW, York River and off-shore, common, silt-clay and detritus.

Gammaridae

Carinogammarus mucronatus (Say, 1818). MW, Zostera bed, GP, common.

Elasmopus pocillimanus (Bate, 1862). MW, Zostera bed, GP, abundant, above 10 o/oo. Lower James, abundant on Aeверrillia armata, November 1963.

Gammarus annulatus Smith, 1873. MW, 0-10 o/oo, abundant in upper York River.

Melita fresneli (Audouin, 1826). TEB, MW, common; Zostera beds, sponges and hydroids; GP.

M. nitida Smith, 1871-72. MW, York River, 10-20 o/oo, scarce; ES, common.

Haustoriidae

Amphiporea virginiana Shoemaker, 1933. CRS, Virginia Beach, intertidal, abundant. MW, Sand Bridge, one specimen.

Haustorius arenarius (Slabber). MW, rare in lower bay.

Liljeborgiidae

Listriella clymenellae Mills, 1962. TEB, commensal with Clymenella.

Lysianassidae

Hippomedon serratus (Holmes, 1905). PB, MW, offshore, sand, rare.

Lysianopsis alba Holmes, 1903. PB, MW, one specimen, sand, 10 feet, GP.

Oedicerotidae

Monoculodes edwardsi Holmes, 1903. TEB, MW, sand, euryhaline, abundant lower York; scarce, P-40.

Photidae

Leptocheirus plumulosus Shoemaker, 1935. MW, abundant, apparently forming firm aggregate of sand tubes at Bell Rock in York River, in creeks and quiet areas living in coarse organic debris, to 600/sq.m.

Phoxocephalidae

Paraphoxus spinosus Holmes, 1903. MW, Tue Marsh Light, hard sand, 200/sq.m.

Stenothoidae

Parametopella cypris (Holmes, 1903). TEB, MW, sponges, GP, summer, common.

Stenothoe gallensis (Walker, 1904). TEB, collected on ES by Sewell Hopkins.

Talitridae

Orchestia palustris Smith, 1871-72. MW, Spartina marsh, GP, common.

O. platensis Kroyer, 1845. MW, high intertidal sand, GP, rare.

Talorchestia longicornis (Say, 1818). MW, high intertidal sand, abundant.

Suborder Hyperiidea

Hyperiidae

Hyperia galba (Montagu, 1813). Mouth of Patuxent River (Bowman, et al, 1963).

Hyperoche medusarum (Kroyer). TEB and F. J. Schwartz, Patuxent River. JM, York River, plankton tow.

Suborder Caprellidea

Caprellidae (See McCain, in press)

Caprella geometrica Say, 1818. JM, abundant lower bay, on sponges and hydroids, population variable.

C. equilibra Say, 1818. As above species.

Paracaprella tenuis Mayer, 1903. JM, abundant, more benthic than above species.

Order Decapoda (This section was compiled by Mr. Willard A. Van Engel unless otherwise noted.)

Suborder Natantia

Supersection Natantia

Section Penaeidea

Sergestidae

Acetes americanus carolinae Hansen. October-November, York River.

Penaeidae

Penaeus aztecus Ives, 1891. Taken in bay and several rivers, July, November, January. Juveniles taken in Back River, November.

P. duorarum Burkenroad, 1939. Almost all months, in bay and several rivers, several from York River. Juveniles taken September and October.

P. setiferus (L., 1767). Apparently most frequently taken of peneids. Records from May 21-December 10; most records from Tue Marsh Light area and lower bay; low salinity tolerance indicated by records from Allmondsville on York and Skiffes Creek and Chickahominy River on James. Juveniles taken September-December.

Trachypenaeus constrictus (Stimpson, 1871). Reported by Cowles from lower bay.

Section Caridea

Palaemonidae

Macrobrachium ohione (Smith, 1874). Two records, Jamestown Island and at Hopewell, James River.

Palaemonetes intermedius Holthuis, 1949. Uncommon, in eel grass beds in shallow water. York River below Gloucester Point, and Broad Bay, Lynnhaven; Pocomoke Sound. FAC, bayside creeks, ES.

P. paludosus (Gibbes, 1850). Several records from fresh water.

P. pugio Holthuis, 1949. Most abundant species. Common from mouth of York River to Cumberland Landing in the Pamunkey River. Also Pocomoke Sound and Broad Bay. FAC, Finney Creek, ES.

P. vulgaris (Say, 1818). York River below Gloucester Point, and Broad Bay, Lynnhaven. More common than P. intermedius. FAC, bayside creeks, ES.

Alpheidae

Alpheus heterochaelis Say, 1818. Taken in bay and York River as far up as Gloucester Point. Often found in trays of oysters.

A. normanni Kingsley, 1879. Taken from same areas in York River as above species; also lower bay. FAC, Cherrystone Creek, ES.

Ogyrididae

Ogyrides alphaerostris (Kingsley, 1880). Kingsley reported a single specimen collected by H. E. Webster from the Atlantic side of Northampton County. Never found again in Virginia.

O. limicola Williams, 1955. MW, occurs in ooze of deeper parts of York River below the bridge in numbers up to 150/sq. meter. Also found in Bradford Bay, Accomack County (Atlantic side), 32.5 o/oo salinity. Rare in Chesapeake Bay.

Hippolytidae

Hippolysmata wurdemanni (Gibbes, 1850). Reported by Cowles from lower bay.

Hippolyte pleuracantha (Stimpson, 1874). Green-colored shrimp taken frequently in eel grass.

Crangonidae

Crangon septemspinosus (Say, 1818). Numerous records from the bay and rivers, collected in the Pamunkey River at Lee Marsh and Hill Marsh. See Price, 1962, for life history.

Suborder Reptantia

Section Macrura

Homaridae

Homarus americanus H. Milne-Edwards, 1837. A few small lobsters 9 to 13 inches total length have been caught in crab pots and by dredges from November to May in the bay and York and Back rivers. Lobsters up to 25 pounds are frequently caught with scup and sea bass by trawlers in 30 to 100 fathoms off the Virginia coast.

Callianassidae

Callianassa stimpsoni Smith. Reported by Cowles from lower bay.

Upogebia affinis (Say, 1818). Taken frequently from shallow areas of lower York River by digging. Occasionally taken in the bay to 65 feet.

Section Anomura

Porcellanidae

Polyonyx gibbesi Haig, 1956. Commensal with Chaetopterus; numerous records from lower bay, one from Gloucester Point.

Euceramus praelongus Stimpson, 1860. Many records from lower bay; few taken in York River at Gloucester Point.

Diogenidae

Clibanarius vittatus (Bosc, 1802). Collected rarely near Gloucester Point; perhaps through introduction; taken on Eastern Shore by H. D. Hoese, September 1961.

Paguridae

Pagurus longicarpus Say, 1817. Common at Gloucester Point, particularly in late summer and fall.

Cowles reported it from the mouth of the Potomac to the Atlantic at salinities of 18-30.6 o/oo.

P. pollicaris Say, 1817. Common in lower bay, although Cowles reported it from salinities beginning at 18.9 o/oo.

Hippidae

Emerita talpoida (Say, 1818). Abundant at Sand Bridge Beach and other outer beaches.

Section Brachyura

Section Oxystomata

Calappidae

Calappa flammea (Herbst, 1794). Taken offshore occasionally.

Hepatus epheliticus (L., 1763). Rathbun listed a single specimen for Chesapeake Bay taken in 1880. Cowles reported it without a specific locality. No other records north of Hatteras are known.

Portunidae

Arenaeus cribrarius (Lamarck, 1818). One specimen taken. Reported as common offshore by Rathbun, who recorded specimens from Smith's Island and Cape Charles.

Callinectes sapidus Rathbun, 1896. Common to abundant in bay and rivers all months; population variable from year to year.

Ovalipes ocellatus (Herbst, 1799). Common on sand bottom along outer beaches and at bay mouth.

Mid-bay (Mansueti, 1962). Yorktown, 1 ♂ dug from sand, November 30, 1963, Dexter Haven.

Portunus gibbesii (Stimpson, 1859). Taken occasionally in lower bay.

Cancriidae

Cancer borealis Stimpson, 1859. Has been taken offshore at depths below 18 fms. Washington Canyon 60 fms, February 8, 1965.

C. irroratus Say, 1817. Common lower bay and offshore.

Xanthidae

Eurypanopeus depressus (Smith, 1869). Most common xanthid of oyster bars; taken at depths of 6-60 feet.

Hexapanopeus angustifrons (Benedict and Rathbun, 1891). Uncommon in lower bay, at depths of 28-150 feet.

Neopanope texana sayi (Smith, 1869). Ryan (1956) indicated an apparent decline of this species since Cowles reported it in abundance. Found mainly in lower bay. Second most abundant xanthid.

Panopeus herbsti H. Milne-Edwards, 1834. Common in lower bay and lower York River, 10-34 o/oo, see Schwartz and Cargo, 1960.

Rhithropanopeus harrisii (Gould, 1841). Found throughout area at all salinities, mainly in more brackish water and at depths above 30 feet where abundant detritus occurs.

Pinnotheridae

Dissodactylus mellitae (Rathbun, 1900). FAC, Kiptopeke Beach, August 1961.

Pinnixa chaetoptera Stimpson, 1860. Common commensal of Chaetopterus variopedatus in bay.

P. cylindrica (Say, 1818). Specimen taken with Arenicola in April 1961 at Gloucester Point.

P. retinens Rathbun, 1818. Holotype came from York River. Juvenile taken off CG pier from mud bottom was identified by Fenner A. Chace, Jr. Common species in Chesapeake area.

P. sayana Stimpson, 1860. One specimen from York River.

Pinnotheres maculatus Say, 1818. Collected twice by Cowles, from off mouth of Potomac and York rivers.

P. ostreum Say, 1817. Common in oysters taken from medium and high salinity waters.

Grapsidae

Sesarma cinereum (Bosc, 1801-1802). Taken frequently along shores where Spartina grass or shelter occurs.

S. reticulatum (Say, 1817). Found in marshes bordering the bay and its tributary rivers.

Ocypodidae

Ocypode quadrata (Fabricius, 1787). Burrowing above high tide in outer sand beaches, and bayside beaches from New Point Comfort to Fort Monroe.

Uca minax (Le Conte, 1855). Found in salt marshes and along creek banks; tolerates lower salinities than other fiddlers.

U. pugnax (Smith, 1870). Common along muddy banks and in Spartina grass areas.

U. pugilator (Bosc, 1801-1802). Generally frequents more sandy areas than the last species; both are confined to lower parts of bay area.

Majidae

Libinia dubia H. Milne-Edwards, 1834. Small specimens taken in York River in summer. Adults in lower York and bay.

L. emarginata Leach, 1815. Numerous specimens taken off mouth of York and in lower bay during crab dredging operations.

Superorder Stomatopoda

Squillidae

Squilla empusa Say. Common in Chesapeake Bay and lower York River.

PHYLUM ECHINODERMATA

Class Asteroidea

Order Forcipulata

Asteriidae

Asterias forbesi (Desor, 1848). Frequent in bay below Maryland-Virginia line (Cowles, 1930). Found recently by VIMS personnel only near bay mouth, sand bottom; formerly to York Spit Light and Wolf Trap in abundance (Sewell Hopkins).

Astropectinidae

Luidia clathrata (Say, 1825). MW, off Great Wicomico River, 80-100 feet. One specimen taken September 16, 1957, by James Whitcomb.

Class Holothuroidea

Order Apoda

Synaptidae

Leptosynapta tenuis (Ayres, 1851). Found in fine sand of shallow areas with medium salinities at numbers up to 100/sq. meter. Less abundant in deeper areas and in Zostera beds.

Order Dendrochirota

Cucumariidae

Cucumaria pulcherrima (Ayres, 1852). Infrequent on oyster grounds of lower York River.

Thyone briareus (LeSueur, 1824). JDA, less common than formerly, taken at Wormley Rock, 1955; common at mouth of Cherrystone Creek, Eastern Shore, March 1961; MW, York River, off VIMS, 25 feet.

Class Ophiuroidea

Order Ophiurae

Ophiodermatidae

Ophioderma brevispina (Say, 1825). Cape Charles (Richards, 1931).

Amphiuridae

Amphioplus abditus (Verrill). Cowles reported this species from the mouth of the bay where salinities were above 30.

Amphiodia atra Stimpson. LT, MW, bay and York River, abundant to York River bridge, soft bottom.

Ophiothricidae

Ophiothrix angulata (Say, 1825). LT, taken only once at mid-bay, January 7, 1958. Tangier Sound, 2 1/3-13 fms. (Koeler, 1914).

Class Echinoidea

Order Centrechinoidea

Arbaciidae

Arbacia punctulata (Lamarck, 1816). Willis G. Hewatt found a single test of this species on Old Plantation Flat, on sand bottom at a depth of 30 feet. Hog Island Bay, ES. Rudee Inlet, July 1965, Robert Bailey.

Order Exocycloida

Suborder Cyppeastrina

Scutellidae

Mellita quinquiesperforata (Leske, 1778). York Spit Light (rare) and seaward. Strangely, Cowles made no mention of this species.

PHYLUM CHAETOGNATHA

(Information from Grant, 1962; an offshore study, but six of the species may occur in the lower bay.)

Sagitta elegans Verrill, 1873. Common in late winter and spring.
MW, abundant in bay, December 1963 - March 1964.

Sagitta enflata Grassi, 1883. Present June - January; abundant
July and August.

Sagitta helenae Ritter-Zahony, 1910. Taken July - September, most
common in August.

Sagitta hispida Conant, 1895. Inshore; sporadic, most frequent in
November.

Sagitta serratodentata Krohn, 1853. Most abundant species taken
offshore. Bay distribution unknown.

Sagitta tenuis Conant, 1896. Present in summer and most common
in September.

PHYLUM HEMICHORDATA

Class Enteropneusta
Harrimaniidae

Saccoglossus kowalewskii (A. Agassiz, 1873). MW,
abundant in shallow areas of fine sand bottom.
Less common in deeper water. The eating of
enteropneusts causes the "ticky" condition of
fish, i.e., smelling strongly of iodoform.

PHYLUM CHORDATA

Subphylum Urochordata (Tunicata)

Class Ascidiacea

Order Aplousobranchia

Synoicidae

Amaroucium constellatum Verrill, 1871. Chincoteague Bay, abundant on hard substrates, see Schwartz, et al, 1960.

Order Phlebobranchia

Perophoridae

Perophora viridis Verrill, 1871. JDA, found on oysters and trays at VIMS pier in summer and fall, as basal stolons in winter.

Order Stolidobranchia

Botryllidae

Botryllus schlosseri (Pallas, 1766). JDA, rare on oyster beds in lower Chesapeake Bay. MW, large colony on Zostera by VIMS pier, June 18, 1962.

Molgulidae

Molgula manhattensis (DeKay, 1843). MW, abundant on pilings, oyster rocks, any firm substrate above 10 o/oo. Killed only by extreme cold or other adverse conditions, to 1000/sq.m., VEPCO area, York River.

Subphylum Cephalochordata

Branchiostoma caribaeum Sundevall, 1853. Taken in Chesapeake Bay off Rappahannock, also in lower York, sand bottom, very rare.

REFERENCES

- Abbott, R. Tucker. 1954. American seashells. Van Nostrand, Princeton, New Jersey. 541 p., 40 pl. Covers all the larger mollusks. Inadequate for investigators interested in tracing synonymy or in identification of some minute forms.
- Academy of National Science of Philadelphia, Department of Limnology. 1957. York River, Virginia. Biological, chemical and physical studies for the American Oil Company. Mimeo. vol. 1, 117 p.
- Allen, J. F. 1958. Feeding habits of two species of Odostomia. Nautilus 72: 11-15. On O. impressa and O. bisuturalis.
- Andrews, J. D. 1955. Fouling organisms of Chesapeake Bay. Ches. Bay Inst. Inshore Survey Program Interim Report XVII, 16 p. and appendix.
- Andrews, J. D. and C. Cook. 1951. Range and habitat of the clam Polymesoda caroliniana (Bosc) in Virginia (Family Cycladidae). Ecology 32: 758-760.
- Bowman, T. E. 1955. The isopod genus Chiridotea Harger, with a description of a new genus from brackish waters. Jour. Wash. Acad. Sci. 45(7): 224-229. Describes C. almyra n. sp. from New York and Georgia.
- Bowman, T. E. 1961. The copepod genus Acartia in Chesapeake Bay. Chesapeake Sci. 2: 206-207. A report on Wilson's misidentifications.
- Bowman, T. E., C. D. Meyers and S. D. Hicks. 1963. Notes on associations between hyperiid amphipods and medusae in Chesapeake and Narragansett Bays and the Niantic River. Chesapeake Sci. 4: 141-146. Includes descriptive notes and figures on Hyperia galba, H. medusarum and Hyperoche medusarum.
- Burbank, W. D. 1963. Some observations on the isopod, Cyathura polita, in Chesapeake Bay. Chesapeake Sci. 4: 104-105. Note on presence in Maryland and suggestions for research.
- Coe, W. R. 1943. Biology of the nemerteans of the Atlantic Coast of North America. Trans. Conn. Acad. Arts & Sci. 35: 129-328.

- Cowles, R. P. 1930. A biological study of the offshore waters of Chesapeake Bay. Bull. U. S. Bur. Fisheries 46: 277-381. A comprehensive report based on collections of the "Fish Hawk." Valuable hydrographic information and reports on certain groups. Restriction to deeper water presents a distorted view of the fauna, e.g., only nine species of amphipods were reported. Most of the 36 species of polychaetes reported by Treadwell were kindly rechecked by Dr. Marian Pettibone and the correct names are included in the present list. Only ten of the names remain unchanged. It is unfortunate that Cowles was unable to include the mollusks.
- Cronin, L. E., J. C. Daiber and E. M. Hurlburt. 1962. Quantitative seasonal aspects of zooplankton in the Delaware River estuary. Chesapeake Sci. 3: 63-93. Nearly all the species listed may be found in Chesapeake Bay.
- Davis, C. C. 1944. On four species of Copepoda new to Chesapeake Bay, with a description of a new variety of Paracalanus crassirostris Dahl. Maryland Dept. of Research and Education. Ches. Biol. Lab. Publ. No. 61. 11 p., 2 pl. In addition to the new variety, Acartia tonsa and two freshwater species are reported.
- Dutcher, B. W. and F. J. Schwartz. 1962. A preferential parasitic copepod-oyster toadfish association. Chesapeake Sci. 3: 213-215.
- Ferguson, F. F. and E. R. Jones. 1949. A survey of the shoreline fauna of the Norfolk Peninsula. Amer. Midl. Nat. 41: 436-446. A faunal list, much more lengthy for some groups, such as flatworms, than for others. Has 28 flatworms, 16 identified only to genus. Contains several errors.
- Ferguson, F. F. and E. R. Jones, Jr. 1940. Studies on the turbellarian fauna of the Norfolk area, I. Amer. Midl. Nat. 24: 184-189.
- Ferguson, F. F., M. A. Stirewalt and W. A. Kepner. 1940. A new turbellarian worm (Rhabdocoele) from Beaufort, North Carolina, Phonorhynchus pearsei n. sp. J. Elisha Mitchell Sci. Soc. 56: 111-122, 1 pl. Reported later from Norfolk area.
- Fraser, C. M. 1944. Hydroids of the Atlantic coast of North America. Univ. of Toronto Press, Toronto. 451 p., 94 pl.
- Frey, D. G. 1946. Oyster bars of the Potomac River. U. S. Fish and Wildlife Service, Spec. Sci. Rep. No. 32, 93 p. List of common invertebrates.

- Grant, G. C. 1962. The Chaetognatha of the inner continental shelf waters off Virginia, their taxonomy, abundance, and dependence on physical factors of the environment. M. A. Thesis. College of William and Mary, Williamsburg, Va., 60 p.
- Grant, G. C. 1963. Investigations of inner continental shelf waters off lower Chesapeake Bay, Part IV. Descriptions of the Chaetognatha and a key to their identification. Chesapeake Sci. 3: 107-119.
- Grant, G. C. 1963. Chaetognatha from inshore coastal waters off Delaware, and a northward extension of the known range of Sagitta tenuis. Chesapeake Sci. 4: 38-42.
- Gray, E. A. 1942. Ecological and life history aspects of the red-jointed fiddler crab, Uca minax (Le Conte), region of Solomons Island, Md. Maryland Dept. of Research and Education. Ches. Biol. Lab. Publ. No. 51, 20 p.
- Hargis, W. J., Jr. 1958. The fish parasite Argulus laticauda as a fortuitous human epizoon. J. Parasitol. 44: 45.
- Hartman, Olga. 1945. The marine annelids of North Carolina. Duke Univ. Mar. Lab. Bull. No. 2, 51 p., 10 pl. Lists 104 species from North Carolina, mainly from the Beaufort region, including six new species and subspecies and several new combinations. No key is included and the names of some species have since been changed. Of the included species, 55 are found in this checklist.
- Hartman, W. D. 1958. Natural history of the marine sponges of southern New England. Yale Univ. Peabody Mus. of Nat. Hist. Bull. 12, 155 p. Excellent systematic work; records Haliclona loosanoffi from Solomons Island, Md.
- Hedgpeth, J. W. 1948. The Pycnogonida of the western north Atlantic and the Caribbean. Proc. U. S. Nat. Mus. 97: 157-342. A thorough study which lists five species from Chesapeake Bay. Depths given as fathoms for the bay should be feet.
- Henderson, J. B. and P. Bartsch. 1914. Littoral marine mollusks of Chincoteague Island, Va. Proc. U. S. Nat. Mus. 47: 411-421, 2 pls. A total of 81 species and subspecies were found in two days' collecting. The 11 new species are undoubtedly all synonyms. Of the rest, 29 are now known under other names and four cannot be traced. Eleven valid species reported by Henderson and Bartsch are not included in the present checklist.
- Holmes, S. J. 1905. The Amphipoda of southern New England. Bull. U. S. Bur. Fish. 24: 459-529, 13 pl. No work as comprehensive as this for east coast amphipods has since appeared.

- Holthuis, L. B. 1951 and 1952. A general revision of the Palaemonidae (Crustacea Decapoda Natantia) of the Americas. Allan Hancock Found. Publ., Occasional Paper No. 11. 331 p., No. 12, 369 p. Covers the three subfamilies for this hemisphere.
- Hopkins, S. H. 1962. Distribution of species of Cliona (boring sponge) on the Eastern Shore of Virginia in relation to salinity. Chesapeake Sci. 3: 121-127.
- Hopkins, T. L. 1965. Mysid shrimp abundance in surface waters of Indian River Inlet, Delaware. Chesapeake Sci. 6: 86-91.
- Humes, A. G. 1953. Ostrincola gracilis C. B. Wilson, a parasite of marine pelecypods in Louisiana (Copepoda, Cyclopoida). Tulane Stud. Zool. 1: 99-107. A parasite of oysters, mussels and hard clams.
- Humes, A. G. 1954. Mytilicola porrecta n. sp. (Copepoda, Cyclopoida) from the intestine of marine pelecypods. J. Parasitol. 40: 186-194. Common in Mytilus and Modiolus.
- Hyman, L. H. 1940. The polyclad flatworms of the Atlantic Coast of the United States and Canada. Proc. U. S. Nat. Mus. 89: 449-495.
- Jachowski, R. 1963. Observations on the moon jelly, Aurelia aurita, and the spider crab, Libinia dubia. Chesapeake Sci. 4: 195.
- Jones, E. R., Jr. and F. F. Ferguson. 1948. Studies on the turbellarian fauna of the Norfolk area. II. Jensenia lewisi n. sp. Trans. Amer. Micr. Soc. 67: 305-314.
- Jones, E. R., Jr. and F. F. Ferguson. 1957. The genus Dinophilus (Archiannelida) in the United States. Am. Midl. Nat. 57: 440-449. Description of D. jagersteni.
- Jones, N. S. and W. D. Burbanck. 1959. Almyracuma proximoculi gen. et sp. nov. (Crustacea, Cumacea) from brackish water of Cape Cod, Massachusetts. Biol. Bull. 116: 115-124.
- Koeler, R. 1914. A contribution to the study of the ophiurans of the United States National Museum. U. S. Nat. Mus. Bull. 84: 1-173.
- Kornicker, L. S. and C. D. Wise. 1962. Sarsiella (Ostracoda) in Texas bays and lagoons. Crustaceana 4: 57-74. Describes two species common in our area.
- Kramp, L. P. 1961. Synopsis of the medusae of the world. J. Mar. Biol. Assoc. U. K. 40, 469 pp.

- Kunkel, B. W. 1918. The Arthrostraca of Connecticut. Conn. Geol. and Nat. Hist. Surv. Bull. 26, 261 p. Descriptions and figures of amphipods and isopods.
- Littleford, R. A. 1939. Distribution of Rathkea. Nature 143: 1070-1. December bloom at Solomons' Is., Md. constituted a range extension from Narragansett Bay.
- Littleford, R. A. 1939. The life cycle of Dactylometra quinquecirrha, L. Agassiz in the Chesapeake Bay. Biol. Bull. 77: 368-381. Report of a doctoral work on this nefarious organism.
- McCaul, W. E. 1963. Rhynchocoela: nemerteans from marine and estuarine waters of Virginia. J. Elisha Mitchell Sci. Soc. 79: 111-124.
- McErlean, A. J. 1964. Characteristics of Macoma balthica populations in the middle Patuxent estuary. Chesapeake Sci. 5: 200-208.
- McMahon, J. W. 1963. Monogenetic trematodes from some Chesapeake Bay fishes. Part I: The superfamilies Capsaloidea Price, 1936 and Diclidophoroidea Price, 1936. Chesapeake Sci. 4: 151-160.
- McMahon, J. W. 1964. Monogenetic trematodes from some Chesapeake Bay fishes. Part II. The superfamily Diclidophoroidea. Chesapeake Sci. 5: 124-133.
- Mangum, C. P. 1962. Studies on speciation in maldanid polychaetes of the North American Atlantic coast. I. A taxonomic revision of three species of the subfamily Euclymeninae. Postilla, Yale Peabody Museum of Natural History, No. 65, 12 p. Includes two Chesapeake species.
- Mangum, C. P. 1964. Studies on speciation in maldanid polychaetes of the North American Atlantic coast. II. Distribution and competitive interaction of five sympatric species. Limnol. and Oceanog. 9: 12-26.
- Mansueti, R. J. 1962. Calico crab, Ovalipes o. ocellatus, in mid-Chesapeake Bay, Md. Chesapeake Sci. 3: 129-130.
- Maturo, F. J. S., Jr. 1957. A study of the Bryozoa of Beaufort, N. C. and vicinity. J. Elisha Mitchell Sci. Soc. 73: 11-68. The 59 species reported and described include 21 of those reported from Chesapeake Bay. The descriptions and 69 excellent figures make this an invaluable work for the Chesapeake Bay area.
- Mayer, A. G. 1911. Ctenophores of the Atlantic Coast of North America. Carnegie Inst. of Washington, Publ. no. 162: 1-58, 17 pl.

- Mills, E. L. 1962. A new species of liljeborgiid amphipod, with notes on its biology. *Crustaceana* 4: 158-162. Describes Listriella clymenellae.
- Mills, E. L. 1963. A new species of Ampelisca (Crustacea: Amphipoda) from eastern North America, with notes on other species of the genus. *Can. J. Zool.* 41: 971-989. Description of the abundant A. vadorum, formerly called A. spinipes.
- Mills, E. L. 1964. Ampelisca abdita, a new amphipod crustacean from eastern North America. *Can. J. of Zool.* 42: 559-575. Exhaustive description of an abundant sibling species of A. vadorum found in finer sediments.
- Mills, E. L. 1964. Noteworthy amphipoda (Crustacea) in the collection of the Yale Peabody Museum. Postilla, Yale Peabody Museum of Natural History, No. 79, 41 p. Complete redescriptions and figures of Melita nitida, Ampithoe longimana, A. valida, and Cymadusa compta.
- Miner, R. W. 1950. Field book of seashore life. Putnam, New York. 888 p. An attempt to cover all invertebrate groups found from Nova Scotia to Cape Hatteras, with illustrations and descriptions for over 1,300 species. Its value decreases greatly south of New England. While this is the best work for the Atlantic coast, it was out of date in most parts at the time of printing and becomes more so each year.
- Moore, J. P. 1946. The anatomy and systematic position of Myzobdella lugubris Leidy (Hirudinea). *Acad. Nat. Sci. Phila., Not. Nat.*, No. 184, 12 p. Excellent description.
- Morris, P. A. 1951. A field guide to the shells of the Atlantic and Gulf coasts. Houghton-Mifflin, Boston, Mass. 236 p., 45 pl. A good field guide for the beginner. Unfortunately, it does not include many of the common minute mollusks.
- Newell, I. M. 1947. A systematic and ecological study of the Halacaridae of eastern North America. *Bull. Bing. Oceangr. Coll.* 10, 252 p. A study which increased the number of halacarid species known to eastern North America from 4 to 41, 14 of these described as new. Includes some Chesapeake material. Details on collection and study techniques.
- Old, M. C. 1941. The taxonomy and distribution of the boring sponges (Clionidae) along the Atlantic coast of North America. Maryland Dept. of Research and Education, Ches. Biol. Lab. Publ. No. 44, 30 p., 13 pl. Covers seven species of Cliona, three described as new. A key and figures for six are provided.

- Osburn, R. C. 1944. A survey of the Bryozoa of Chesapeake Bay. Maryland Dept. of Research and Education, Ches. Biol. Lab. Publ. No. 63, 55 p. A comprehensive account of Chesapeake forms, particularly those from less saline waters. Includes a glossary and keys to families.
- Pettibone, M. H. 1963. Marine polychaete worms of the New England region, Part I, Families Aphroditidae through Trochochaetidae. Bull. U. S. Nat. Mus., 227: 1-356.
- Pettibone, M. H. 1963. Revision of some genera of polychaete worms of the family Spionidae, including the description of a new species of Scolelepis. Proc. Biol. Soc. Wash. 76: 89-104.
- Pfizenmeyer, H. T. 1960. Notes on the nudibranch, Elysia chlorotica, from Chesapeake Bay, Maryland. Chesapeake Sci. 1: 114-115.
- Pfizenmeyer, H. T. 1961. Benthic shoal water invertebrates from tidewater of Somerset County, Md. Chesapeake Sci. 2: 89-94. Macro-invertebrate populations collected with a hydraulic dredge.
- Pfizenmeyer, H. T. and K. G. Drobeck. 1964. The occurrence of the brackish water clam, Rangia cuneata, in the Potomac River, Maryland. Chesapeake Sci. 5: 209-212.
- Pilsbry, H. A. 1916. The sessile barnacles (Cirripedia) contained in the collections of the U. S. National Museum; including a monograph of the American species. Bull. U. S. Nat. Mus. No. 93, 366 p., 76 pls.
- Pratt, H. S. 1951. Manual of the common invertebrate animals. P. Blakiston, Philadelphia, Pa. 854 p. While this volume spreads itself too thinly in covering both freshwater and marine environments, it is valuable for its keys and morphological discussion.
- Price, K. S. 1962. Biology of the sand shrimp, Crangon septemspinosa, in the shore zone of the Delaware Bay region. Chesapeake Sci. 3: 244-255.
- Rathbun, M. J. 1918. The grapsoid crabs of America. Bull. U. S. Nat. Mus. No. 97, 461 p.; 1925. The spider crabs of America. Bull. U. S. Nat. Mus. No. 129, 613 p.; 1930. The Cancroid crabs of America. Bull. U. S. Nat. Mus. No. 152, 609 p. These volumes are helpful for the Chesapeake area.
- Richards, H. G. 1931. Notes on the marine invertebrate fauna of the Virginia Capes. Ecology 12: 443-444.

- Richardson, H. 1905. A monograph of the isopods of North America. Bull. U. S. Nat. Mus. No. 54, 727 p. Several records for Chesapeake Bay, some of which are apparently in error in reporting depths as fathoms rather than feet.
- Ryan, E. P. 1956. Observations on the life histories and distribution of the Xanthidae (mud crabs) of Chesapeake Bay. Amer. Midl. Nat. 56: 138-162. An excellent key and much other information make this paper essential to anyone interested in these abundant crabs.
- Shaw, W. N. 1965. Seasonal setting patterns of five species of bivalves in the Tred Avon River, Maryland. Chesapeake Sci. 6: 33-37.
- Scheltema, R. S. and R. V. Truitt. 1954. Ecological factors related to the distribution of Bankia gouldi Bartsch in Chesapeake Bay. Maryland Dept. of Research and Education, Ches. Biol. Lab. Publ. No. 100, 31 p.
- Scheltema, R. S. and R. V. Truitt. 1956. The shipworm Teredo navalis in Maryland coastal waters. Ecology 37: 841-843.
- Schwartz, F. J. 1960. The barnacle, Platylepas hexastylus, encrusting a green turtle, Chelonia mydas mydas, from Chincoteague Bay, Md. Chesapeake Sci. 1: 116-117.
- Schwartz, F. J. and D. G. Cargo. 1960. Recent records of the xanthid crab, Panopeus herbsti, from Maryland and Virginia waters. Chesapeake Sci. 1: 201-203.
- Schwartz, F. J., M. Castagna and G. Griffith. 1960. Comments on the abundance and ecology of the ascidian Amaroucium constellatum in Sinepuxent and Chincoteague Bays. Chesapeake Sci. 1: 197-199.
- Shoemaker, C. R. 1926. Amphipods of the family Bateidae in the collection of the United States National Museum. Proc. U. S. Nat. Mus. 68, art. 25, 26 p. Reports Batea catharinensis Müller; several hundred specimens taken by "Fish Hawk" in Chesapeake Bay.
- Shoemaker, C. R. 1933. A new amphipod of the genus Amphiporeia from Virginia. J. Wash. Acad. Sci. 23: 212-216. Intertidal species found at Virginia Beach.
- Shoemaker, C. R. 1947. Further notes on the amphipod genus Corophium from the east coast of America. J. Wash. Acad. Sci. 37: 47-63. Supersedes a paper published in 1934; covers 12 species known to Western Atlantic.

- Sieling, F. W. 1960. A notable range extension of the southern drill, Thais haemastoma floridana, into Chincoteague Bay. Chesapeake Sci. 1: 212-215.
- Steinberg, J. E. and E. C. Dougherty. 1957. The skeleton shrimps (Crustacea: Caprellidae) of the Gulf of Mexico. Tulane Stud. Zool. 5: 267-288. Descriptions of eight species, including two identified from Chesapeake Bay area by Dr. Steinberg. A valuable account of a neglected group, although many problems are left unanswered.
- Stirewalt, M. A., W. A. Kepner and F. F. Ferguson. 1940. A new turbellarian worm (alloeocoele) from Beaufort, North Carolina, Archiloa wilsoni n. sp. J. Elisha Mitchell Sci. Soc. 56: 123-133, 2 pls. Reported later from Lafayette River.
- Thomas, L. P. 1964. Amphiodia atra (Stimpson) and Ophionema intricata Lutken, additions to the shallow water amphiuroid brittlestar fauna of Florida. Bull. Mar. Sci. Gulf and Caribbean 14(1): 158-167. Redescription of Amphiodia atra including mention of specimens from Virginia.
- Timm, R. W. 1952. A survey of the marine nematodes of Chesapeake Bay, Maryland. Maryland Dept. of Research and Education, Ches. Biol. Lab. Publ. No. 95, 70 p., 13 pls. A total of 78 species in 44 genera are described. One genus and 36 species are new. Collections made from Sept. to March at depths up to 50 feet and salinities of 8-16.9 o/oo.
- Tressler, W. L. and Essie M. Smith. 1948. An ecological study of seasonal distribution of Ostracoda, Solomons Island, Md. region. Maryland Dept. of Research and Education, Ches. Biol. Lab. Publ. No. 71, 57 p., 4 pls. A discussion of 13 littoral species, 6 of them described as new.
- Uhler, P. R. 1878. List of animals observed at Fort Wool, Virginia. Chesapeake Zool. Lab. Sci. Results of 1878; Johns Hopkins University, pp. 17-33.
- Van Engel, W. A., W. A. Dillon, D. Zwerner, and D. Eldridge. 1965. Loxothylacus panopei (Cirripectida, Saccalinidae) an introduced parasite on a xanthid crab in Chesapeake Bay, U.S.A. Crustaceana 10: 111-112.
- Virginia Academy of Science. James River Project Committee. 1950. The James River basin, past, present and future. Richmond, Va. 843 p. Has a list of freshwater mollusks by Paul R. Burch and a short discussion on marine life by Nelson Marshall.
- Webster, H. E. 1879. On the Annelidan Chaetopoda of the Virginia coast. Trans. Albany Inst. 9: 202-272.

- Wells, H. W. 1957. Abundance of the hard clam Mercenaria mercenaria in relation to environmental factors. Ecology 38: 123-128. Chincoteague Bay survey.
- Wells, H. W. 1965. Maryland records of the gastropod, Littorina littorea, with a discussion of factors controlling its southern distribution. Chesapeake Sci. 6: 38-42.
- Wells, H. W. and M. J. Wells. 1961. Three species of Odostomia from North Carolina, with description of a new species. Nautilus 74: 149-157. A valuable contribution to knowledge of the common but little known pyramidellids. Describes O. dianthophylla, a parasite of Eupomatus, and records O. seminuda from Aequipecten. Figures these two and O. dux, which has been taken once in the York River.
- Wells, H. W., M. J. Wells and I. E. Gray. 1960. Marine sponges of North Carolina. J. Elisha Mitchell Sci. Soc. 76: 200-245. An account of 70 species taken on the coast of North Carolina, including descriptions of five new species. Of particular value for students. The 61 figs. cover most of the species.
- Williams, A. B. 1955. The genus Ogyrides (Crustacea: Caridea) in North Carolina. J. Wash. Acad. Sci. 45: 56-59.
- Wilson, C. B. 1932. The copepod crustaceans of Chesapeake Bay. Proc. U. S. Nat. Mus. 80, 54 p. An account of 64 species taken in bay and on a trip to the 100 fm. line. Descriptions of four new species from the bay. May contain several errors (see Bowman, 1961).
- Woods Hole, Massachusetts, Marine Biological Laboratory. 1964. Keys to marine invertebrates of the Woods Hole region, R. I. Smith, editor. Systematics-Ecology Program Contr. No. 11. A manual which partially supersedes that of Miner (1950). Taxonomy is updated but, as must be expected, treatment of the groups varies considerably and a few containing smaller organisms are omitted. Illustrations, check lists, literature references and some commentary enhance the value of the keys. If one includes the oceanic habitat, probably 50% of the species may be found in Virginia.
- Zimmer, C. 1943. Uber neue und weniger bekannte Cumaceen. Zool. Anz. 141: 147-167.

INDEX

- Abra 23
Acartia 30
Acetes 38
Acteon 26
Aegathoa 34
Aequipecten 21
Aetea 13
Aeverrillia 13
Agauopsis 28
Aglaophamus 16
Aiptasia 6
Aiptasiomorpha 7
Alcyonidium 12
Aligena 22
Alpheus 38
Alteutha 31
Amaroucium 45
Amathia 13
Ampelisca 33
Amphidura 18
Amphiodia 48
Amphioplus 43
Amphiporea 36
Amphiporus 12
Amphitrite 20
Ampithoe 35
Amygdalum 21
Anachis 26
Anadara 21
Ancinus 35
Ancistrosyllis 18
Anguinella 13
Annelida 14 ff
Anomia 21
Anoplodactylus 28
Arabella 15
Arbacia 43
Arenaeus 40
Arenicola 15
Argulus 33
Aricidea 17
Arthropoda 28 ff
Asabellides 14
Asterias 42
Astrangia 7
Atylus 36
Aurelia 6
Autolytus 19
Axinoides 9

Balanus 33
Bankia 24

Barentsia 12
Barnea 24
Batea 36
Bdelloura 8
Benedenia 8
Beroe 7
Bicotylophora 9
Bittium 25
Bomolochus 32
Botryllus 45
Bougainvilleia 4
Bowerbankia 13
Brachidontes 21
Branchiostoma 45
Brania 19
Bucephalus 10
Bugula 14
Busycon 26

Caecum 25
Calanus 29
Calappa 40
Caligus 33
Callianassa 39
Callinectes 40
Callipallene 28
Calyptospadix 4
Campanularia 5
Cancer 40
Candacia 30
Canuella 31
Capitella 15
Caprella 37
Carcinonemertes 11
Cardiomya 24
Carinogammarus 36
Carinoma 11
Carinomella 11
Centropages 30
Cephalochordata 45
Cerapus 36
Ceratonereis 17
Cerebratulus 11
Ceriantheopsis 7
Cerithiopsis 25
Chaetognatha 44
Chaetopleura 27
Chaetopterus 15
Chelonibia 33
Chiridotea 35
Chordata 45
Choricotyle 9

Chrysaora 6
Chthamalus 33
Cirriformia 15
Cletodes 30
Clibanarius 40
Cliona 3
Clupeocotyle 9
Clymenella 16
Clytia 5
Coelenterata 4 ff
Congerina 22
Conopeum 13
Corambella 27
Coronadena 8
Corophium 36
Corycaeus 32
Corycella 32
Corynitis 4
Cossura 15
Crangon 39
Craniella 3
Crassostrea 22
Crepidula 25
Crisia 12
Cryptopontius 32
Ctenophora 7
Cucumaria 43
Cupuladria 13
Cyanea 6
Cyathura 34
Cyclaspis 34
Cyclops 32
Cylichna 27
Cylindroleberis 28
Cymadusa 35
Cyprideis 29
Cyrtopleura 24
Cythere 29
Cytheridea 29
Cytheromorpha 29
Cytherura 29

Dactylopusia 31
Detracia 27
Diadumene 6
Diastylus 34
Dinophilus 14
Diodora 24
Diopatra 17
Diosaccus 31
Diplothyra 24
Dissodactylus 41

- Donax 23
Doropygus 32
Dosinia 22
Drilonereis 15
- Echinodermata 42 ff
Ectinosoma 31
Ectoprocta 12 ff
Edotea 35
Edwardsia 6
Elasmopus 36
Electra 13
Elysia 27
Emerita 40
Empruthotrema 8
Endeis 28
Enoplobranchus 20
Ensis 23
Entoprocta 13
Epitonium 28
Ergasilus 22
Erichsonella 35
Erichthonius 36
Eteone 17
Euceramus 39
Eudendrium 4
Eupleura 25
Eurypanopeus 41
Eurytemora 30
Exogone 19
- Fabricia 18
- Gammarus 36
Gemma 22
Glycera 15
Glycinde 16
Golfingia 20
Gonothyrea 5
Gyptis 16
- Halecium 5
Halichondria 3
Haliclona 3
Halocarus 28
Haloclava 6
Haminoea 26
Harmothoe 18
Harpacticus 31
Haustorius 36
Hemichordata 44
Hemicyclops 32
Hemicythere 29
Hepatus 40
- Heteromastus 15
Hexapanopeus 41
Hippolysmata 39
Hippolyte 39
Hippomedon 36
Hippothoa 14
Homarus 39
Hydractinia 4
Hydroides 18
Hypaniola 14
Hyperia 37
Hyperoche 37
- Ichthyobdella 20
Idotea 35
Inona 34
- Labidocera 30
Laeonereis 17
Laevicardium 22
Lembos 36
Lepidametria 18
Lepidonotus 18
Leptocheirus 37
Leptocheilia 34
Leptocuma 34
Leptocythere 29
Leptodora 28
Leptogorgia 6
Leptosynapta 42
Leptoplana 8
Lernaenicus 33
Lernanthropus 33
Lerneocera 33
Leucon 34
Libinia 42
Ligia 35
Lineus 11
Lironeca 34
Lissodendoryx 3
Listriella 36
Lithidocotyle 10
Littorina 24
Loimia 20
Loimopapillosum 8
Lolliguncula 27
Lovenella 5
Loxoconcha 29
Loxothylacus 34
Lucina 22
Luidia 42
Lumbrineris 16
Lycastopsis 17
Lyonsia 24
- Lysarete 16
Lysianopsis 36
Lysilla 20
- Macoma 23
Macrobrachium 38
Malacobdella 12
Maldanopsis 16
Mangelia 26
Marginella 26
Marphysa 15
Martesia 24
Mazocraeoides 9
Malampus 27
Melinna 14
Melita 36
Mellita 43
Membranipora 13
Mercenaria 22
Metacyclops 32
Microciona 3
Microporella 14
Microsetella 31
Microthalestris 31
Microcotylinae 9
Micrura 11
Mitrella 26
Mnemiopsis 7
Molgula 45
Mollusca 21 ff
Monocotyle 8
Monoculodes 37
Mulinia 23
Mya 24
Mysella 22
Mysidopsis 34
Mytilus 21
Myzobdella 20
- Nassarius 26
Nematostella 6
Nemopsis 4
Neomysis 34
Neopanope 41
Nephtys 16
Nereiphylla 18
Nereis 17
Noetia 21
Nolella 13
Notomastus 15
Nucula 21
- Obelia 5
Octolasmis 33

- Ocypode 41
Odostomia 27
Oerstedia 11
Ogyrides 39
Oithona 31
Olencira 34
Oncaea 32
Ophelia 17
Ophioderma 43
Ophiothrix 43
Orchestia 37
Ovalipes 40
Oxyurostylis 34
- Pagurus 40
Palaemonetes 38
Palaemonetes 15
Pandora 38
Panopeus 40
Paracalanus 29
Paracalanus 37
Paracalanus 35
Parametopella 37
Paranais 18
Paranthus 6
Paraphoxus 37
Parapionosyllis 19
Parapolia 11
Paraprionospio 19
Pectinaria 17
Pedicellina 12
Penaeus 38
Penilia 28
Pennaria 4
Perophora 45
Petricola 22
Phoronidea 14
Phoronis 14
Phyllodoce 18
Physalia 5
Pinnixa 41
Pinnotheres 41
Piscicola 20
Pista 20
Platyhelminthes 8 ff
Platylepas 33
Platynereis 17
Pleurobrachia 7
Plumularia 5
Podarke 16
Podocoryne 4
Polinices 25
Polycirrus 20
Polydora 19
- Polymesoda 22
Polyonyx 39
Pontella 30
Pontodrilus 20
Porifera 3
Porpita 5
Portunus 40
Potomilla 18
Prionospio 19
Pseudaxine 10
Pseudeurythoe 14
Pseudocalanus 30
Pseudodiaptomus 30
Pyramidella 27
- Rangia 23
Rathkea 4
Retusa 26
Rhipidocotyle 10
Rhithropanopeus 41
Rhombognathus 28
Rhopilema 6
Rhynchocoela 11 ff
- Sabella 18
Sabellaria 18
Saccoglossus 44
Sagitta 44
Sarsia 4
Sarsiella 29
Sarsocythere 29
Schizoporella 14
Schizotricha 5
Scolecolepides 19
Scolelepis 19
Scoloplos 17
Scomberocotyle 10
Sertularia 5
Sesarma 41
Sinum 25
Sipunculoidea 20
Solemyidae 21
Solen 23
Sphaeroma 35
Spio 19
Spiochaetopterus 15
Spiophanes 19
Spisula 23
Squilla 42
Stauronereis 15
Stenothoe 37
Sthenelais 18
Streblospio 19
Stylactis 4
- Stylochus 8
- Tachidius 31
Tagelus 23
Tagia 9
Talorchestia 37
Tanystylum 28
Tectonatica 25
Teinostoma 24
Tellina 23
Temora 30
Terebra 26
Teredo 24
Tetrastemma 12
Thais 25
Tharyx 15
Thoracocotyle 10
Thuiaria 5
Thyone 43
Tisbe 31
Trachelobdella 20
Trachypenaeus 38
Travisia 17
Triphora 25
Triticella 13
Tubulanus 11
Turbonilla 27
- Uca 41
Unciola 36
Upogebia 39
Urochordata 45
Urosalpinx 25
- Venericardia 22
Victorella 13
VolSELLA 21
- Xiphosura 28
- Yoldia 21
- Zygeupolia 11