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**Distribution of Decapod  
Crustacea Off Northeastern  
United States Based on  
Specimens at the Northeast  
Fisheries Center,  
Woods Hole, Massachusetts**

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AUSTIN B. WILLIAMS<sup>1</sup> and ROLAND L. WIGLEY<sup>2</sup>

## ABSTRACT

Distributional and environmental summaries are given in an annotated checklist, supplemented by charts, graphs, and tables, for 131 species of marine decapod Crustacea found between the Gulf of Maine and near the mouth of Chesapeake Bay. The geographical area lies mainly on the continental shelf with some extension beyond this to submarine canyons and the upper continental slope. The area lies within two climate zones which influence the distribution of decapods, cold temperate in the north and mild temperate in the south. The list is thought to be reasonably complete for benthic but not for pelagic species. Benthic samples collected with several types of gear by vessels of the National Marine Fisheries Service (NMFS) during the past 25 yr provided the records that are charted. Data from samples on which this report is based are stored in computer files, and selected specimens are preserved in collections at the NMFS Northeast Fisheries Center, Woods Hole, Mass.

## INTRODUCTION

This report presents distributional data for 131 species of marine decapod Crustacea (11 Penaeidea, 41 Caridea, 2 Astacidea, 4 Palinura, 24 Anomura, 49 Brachyura) found between the Gulf of Maine and near the mouth of Chesapeake Bay. The geographical area lies mainly on the continental shelf, with some extension beyond this to submarine canyons and the upper continental slope. The area also lies within two climatic zones which influence the distribution of decapods, cold temperate in the north, mild temperate in the south (Hazel 1970). Cape Cod indicates the approximate boundary between these zones but there are seasonal shifts in position that carry elements of the fauna with them, north in summer, south in winter. Seaward the area is bounded both by cold slope water moving south and meandering fringes of the Gulf Stream moving northeast. Monthly summaries of water temperature in the region were given by Walford and Wicklund (1968), and summaries of surface circulation were given by Bumpus and Lauzier (1965).

The number of species treated, somewhat greater than in Williams' key (1974b), is thought to be reasonably complete for benthic but not for pelagic forms. Charted distributions are extended south of those depicted by Squires (1966). Association of certain species with depth, temperature, and substrate is especially well documented by numerous samples of the families Cancridae, Crangonidae, Geryonidae, Hippolytidae, Majidae, Paguridae, and Pandalidae. Decapods associated with the cold temperate zone include some arctic species;

those from the mild temperate zone include a few species with broad temperature tolerance that are peripheral to their centers of distribution in either the cold temperate zone or the warm temperate zone south of Cape Hatteras. At the greatest depths sampled, a few widespread species from archibenthic slopes of the Atlantic Ocean basin were found along the edge of the continental shelf. The meager records for pelagic species include latitudinal limits of distribution or fringe occurrences in relatively shallow depths.

The locality data charted were taken from samples collected by vessels of the National Marine Fisheries Service (NMFS)—RV *Delaware I* operated out of east Boston and RV *Albatross III*, *Albatross IV*, and *Delaware II*, operated out of Woods Hole, Mass.—during the past 25 yr, supplemented by shore samples collected near Woods Hole and a few samples from other vessels. Decapod crustaceans were not specifically sought; they were taken from biological samples collected for ecological or management studies pertaining mainly to demersal fishes and benthic invertebrates. More than 30 different sampling devices, plus hand capture with the aid of scuba, were used in collecting; however, only a few devices used routinely over the years caught the majority of specimens.

Principal kinds of gear used in obtaining samples were: otter trawls, shrimp trawls, scallop dredges, naturalist's dredges, and several types of bottom grab samplers, namely the Van Veen, Campbell, and Smith-McIntyre grabs. Most specimens were obtained from samples collected by means of otter trawls, the type commonly used being "36 Yankee" which sweeps a path approximately 12 m wide. Normally, the ground rope for this trawl is equipped with rollers which keep the bottom of the net 0.1-0.3 m above the ocean floor. Thus, many bottom-dwelling decapods escaped capture by this net passing

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above them. Dredges, such as the naturalist's dredge that is 1 m wide and the New Bedford sea scallop dredge that is 3.3 m wide, scrape along the sea bottom and are more efficient than trawls in catching most kinds of anomurans and brachyurans. Grab samplers were effective in obtaining only small, abundant, sedentary species.

Relatively few specimens were collected with off-bottom sampling gear, such as plankton nets and the Isaacs-Kidd midwater trawl. Also, only a few samples were collected at the surface by means of dip nets. Because of the extremely limited number of off-bottom samples, the record of pelagic species is fragmentary.

Not shown on the charts are distributional data from inshore surveys (Sumner et al. 1913; Young et al.<sup>3</sup>) of dense nearshore populations of certain species; therefore, the charts should be used in conjunction with both our checklist and other faunal lists in order to form a more complete understanding of distributional patterns.

The annotated checklist summarizes documented world-wide distributional data and supplementary environmental detail for each species. The list is based on new information, specimens, and data in the National Museum of Natural History, Smithsonian Institution, Wash., D.C. (USNM), and published reports; it is patterned on that given by Williams (1974b), which cited principal sources of information.

The classification adopted is that followed by Glaessner (1969). On the basis of fossil record, adult morphology, and method of larval development, the decapod Crustacea are divided into two suborders, a fundamental split that separates certain shrimps from all the remaining groups. The suborder Dendrobranchiata includes shrimps which have the first three pairs of legs chelate, hatch from eggs broadcast in the water, and develop through numerous larval stages beginning with a nauplius; these are essentially the penaeideans. All remaining groups of Decapoda comprise the suborder Pleocyemata whose members have the first three pairs of legs variously chelate, and hatch from eggs retained on the pleopods of the female as larvae advanced beyond the naupliar phase. Beyond the subordinal split the groups, with some rearrangement, fall into the more familiar pattern set forth in standard zoological works.

In the species accounts, geographic distributions are arranged generally from north to south, beginning in the western North Atlantic and extending from there as necessary. Species distributed from the Atlantic Ocean into the Gulf of Mexico can be understood to range around peninsular Florida unless stated to have a disjunction in southern Florida.

Species marked with an asterisk are not plotted on the charts. Four species in the list are from scattered samples taken beyond the limits of the charts. Extremes of depth and temperature from our records which exceed those in the primary literature are given in italics. We acknowl-

edge that exhaustive search might reveal record limits not known to us; also, many of the recorded limits inadequately express true limits for the species.

Figures 1 and 2 present ranked depth-temperature ranges, with means, for selected species of Decapoda from the northeastern United States that are represented by data in the NMFS Woods Hole collection. The relative positions of some of these species are consistent with general knowledge of their thermal and bathymetric requirements, but the rank position of others, as well as their ranges, reflect sampling bias. Association of selected species with six types of substrate is expressed in Table 1 as percent of total samples taken. Species represented by three or fewer samples have been deleted.

Selected specimens from samples upon which this report is based are stored in collections at the NMFS Northeast Fisheries Center, Woods Hole, Mass. Data taken with the samples have been entered in computer files at the Center.

Information on shrimps of economic value was given by Holthuis and Rosa (1965).

## ANNOTATED CHECKLIST

**Class Crustacea**  
**Subclass Malacostraca**  
**Superorder Eucarida**  
**Order Decapoda**  
**Suborder Dendrobranchiata**  
**Infraorder Penaeidea**

**Superfamily Penaeoidea**  
**Family Penaeidae**  
**Subfamily Solenocerinae**

*Hymenopenaeus robustus* Smith 1855. Royal red shrimp. New England off Massachusetts through Straits of Florida, Gulf of Mexico, and West Indies to Curaçao. Moderate commercial fishery. 73-750 m (Burkenroad 1936; W. E. Pequegnat et al. 1971).

*Solenocera necopina* Burkenroad 1939. 39°58'N, 69°34'W, SSE Nantucket; SE Cape Lookout, N.C., through Gulf of Mexico and Caribbean Sea to Islas Testigos, Venezuela; also S Atlantic off Uruguay. Variety of mud to broken shell bottoms, 159-753 m, usually below 180 m, 5.0°-10.8°C (Pérez Farfante and Bullis 1973).

**Subfamily Aristeinae**

*Aristaeomorpha foliacea* Risso 1826. Scarlet prawn. 39°59'N, 70°18'W, S Nantucket; Gulf of Mexico and Caribbean Sea; E Atlantic and Pacific Oceans. Minor E Atlantic commercial fishery. Merobenthonic at around 200-384 m.

*Plesiopenaeus edwardsianus* (Johnson 1867). Gulf of St. Lawrence, 47°30'N, 63°00'W and Atlantic Ocean south of Newfoundland through Gulf of Mexico and Caribbean Sea to Surinam; Azores, Portugal to

<sup>3</sup>Young, D. K., D. Hobson, J. S. O'Connor, A. D. Michael, and M. A. Mills. 1971. Quantitative analysis of the Cape Cod Bay ecosystem. Final rep., Off. Nav. Res., Syst.-Ecol. Program, Mar. Biol. Lab., Woods Hole, Mass., 71 p.



Figure 1.—Ranked bathymetric ranges of selected Decapoda from the northeastern United States represented by data in the NMFS Woods Hole collection.

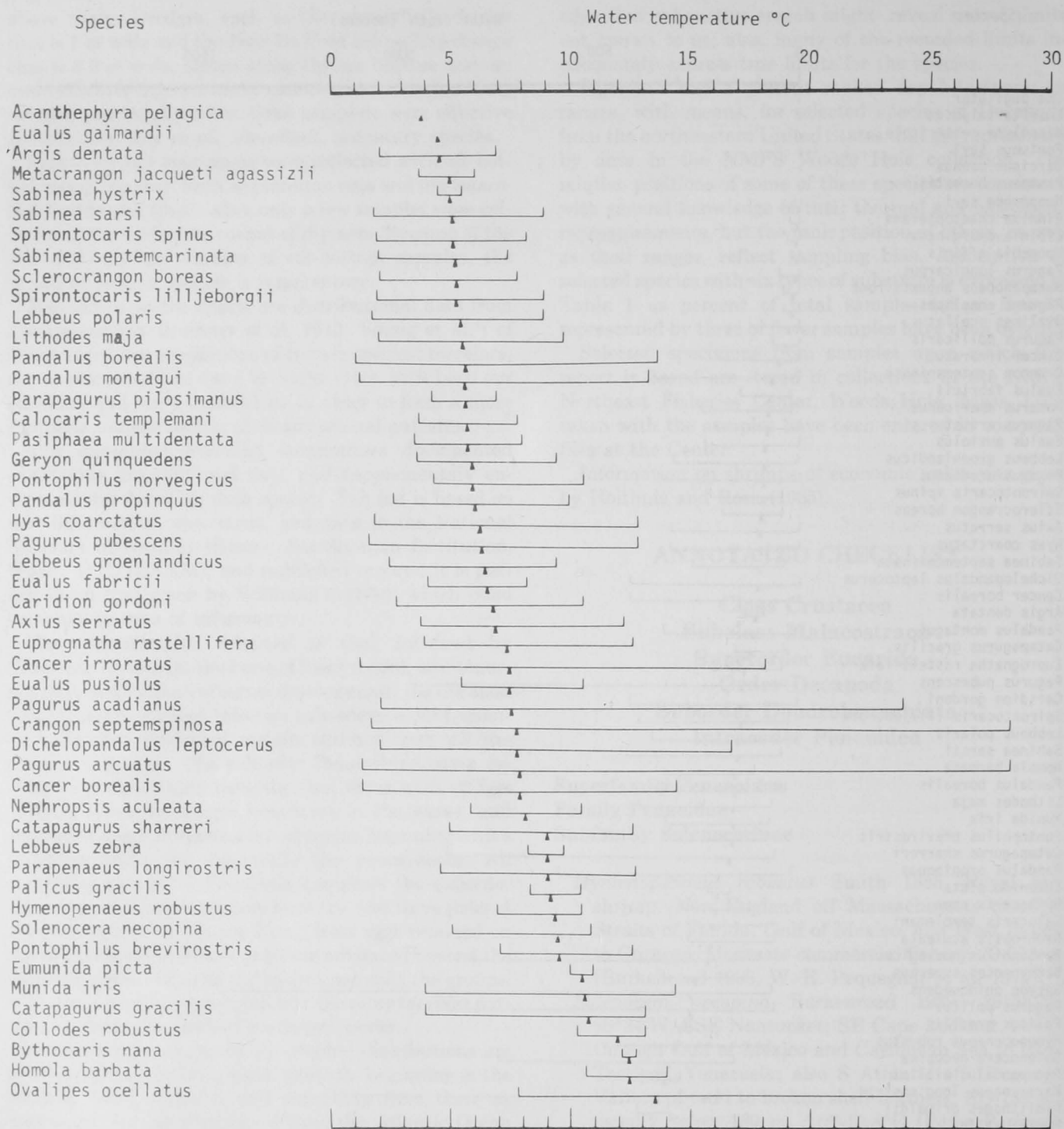


Figure 2.—Ranked temperature ranges of selected Decapoda from the northeastern United States represented by data in the NMFS Woods Hole collection.

South Africa; Indian Ocean from E Africa to Andaman Sea and Sumatra. 274-1,850 m but principally between 400 and 900 m at temperatures of 4°-8°C (Squires 1963; Crosnier et al. 1967; Crosnier and Forest 1973).

*Gennadas valens* (Smith 1884). Western Atlantic from

49°N to mid Gulf of Mexico and Turks Island Passage, Bahamas; Bermuda; E Atlantic from 51°S to 37°S and western corner of Mediterranean Sea. Pelagic, <100-1,500+ m, principally 200-400 (night) to 750-950 m (day) (Burkenroad 1936; Crosnier and Forest 1973; Foxtton 1970; Omori 1974).



Table 1.—Association of selected Decapoda with six types of substrate expressed as percent of total samples taken. This information pertains to specimens in the NMFS Woods Hole collection from off northeastern United States.

Species	Glacial						Number of samples
	Gravel	till	Shell	Sand	Sandy silt	Silty clay	
<i>Axius serratus</i>	38	0	0	31	12	19	16
<i>Calocaris templemani</i>	0	8	0	0	17	75	12
<i>Cancer borealis</i>	35	3	6	44	3	9	100
<i>Cancer irroratus</i>	16	0	10	68	4	2	94
<i>Carcinus maenas</i>	14	0	0	57	29	0	7
<i>Caridion gordonii</i>	50	6	0	25	6	13	16
<i>Catapagurus sharreri</i>	4	0	0	54	34	8	24
<i>Crangon septemspinosus</i>	24	0	5	61	9	1	150
<i>Dichelopandalus leptocerus</i>	35	7	4	33	6	15	150
<i>Eualus fabricii</i>	33	40	8	0	11	8	27
<i>Eualus pusiolus</i>	56	3	3	29	3	6	34
<i>Euprognatha rastellifera</i>	0	0	0	85	15	0	13
<i>Geryon quinquedens</i>	13	3	0	7	3	74	31
<i>Hexapanopeus angustifrons</i>	25	0	50	0	25	0	4
<i>Homarus americanus</i>	0	0	0	67	0	33	6
<i>Hyas coarctatus</i>	62	4	9	19	2	4	150
<i>Lebbeus groenlandicus</i>	71	14	7	4	0	4	28
<i>Lebbeus polaris</i>	54	17	2	11	7	9	99
<i>Libinia emarginata</i>	40	0	40	20	0	0	5
<i>Lithodes maja</i>	25	25	0	16	17	17	12
<i>Munida iris</i>	10	0	10	47	33	0	21
<i>Nematocarcinus rotundus</i>	0	0	0	0	0	100	6
<i>Neopanope sayi</i>	34	0	33	0	33	0	6
<i>Ovalipes ocellatus</i>	7	0	13	80	0	0	15
<i>Pagurus acadianus</i>	33	1	6	57	2	1	150
<i>Pagurus arcuatus</i>	19	3	12	60	6	0	121
<i>Pagurus longicarpus</i>	11	0	11	56	22	0	9
<i>Pagurus politus</i>	0	0	23	47	15	15	13
<i>Pagurus pollicaris</i>	12	0	12	63	13	0	8
<i>Pagurus pubescens</i>	50	15	12	16	4	3	138
<i>Pandalus borealis</i>	24	11	0	14	8	43	166
<i>Pandalus montagui</i>	51	15	4	14	5	11	174
<i>Pandalus propinquus</i>	42	13	2	15	3	25	61
<i>Parapagurus pilosimanus</i>	0	25	0	0	0	75	4
<i>Pinnotheres maculatus</i>	25	0	0	75	0	0	4
<i>Pontophilus brevis-tris</i>	8	0	0	67	25	0	12
<i>Pontophilus norvegicus</i>	22	10	2	19	10	37	49
<i>Sabinea sarsii</i>	70	8	3	8	3	8	38
<i>Sabinea septemcarinata</i>	20	20	0	20	0	40	5
<i>Sclerocrangon boreas</i>	78	11	0	11	0	0	19
<i>Spirontocaris lilljeborgii</i>	52	18	4	15	3	8	77
<i>Spirontocaris spinus</i>	47	32	12	2	2	5	41

### Subfamily Penaeinae

*Parapenaeus longirostris* (Lucas 1849). Atlantic Ocean from south-southeast of Martha's Vineyard, Mass. (rarely), to Gulf of Mexico off Florida, Louisiana, and Yucatán, Mexico; Gulf of Paria off Venezuela; Portugal to Angola; Mediterranean Sea from Spain to Asia Minor. 18 or 20-1,166 m, rarely <50 m and usually not below 500 m, 4.5°-12.7°C (Crosnier and Forest 1973).

*Penaeus (Melicertus) aztecus aztecus* Ives 1891. Brown shrimp. West Falmouth Harbor and Martha's Vineyard, Mass., to off Sanibel Island, Fla.; Apalachicola Bay, Fla., around Gulf of Mexico to NW Yucatán, Mexico. Major commercial fishery. 1 m to 110 m, occasionally 165 m. Summer and fall only in north, rare (Pérez Farfante 1969; Cook and Lindner 1970).

*Penaeus (Litopenaeus) setiferus* (Linnaeus 1767). White shrimp. Fire Island, N.Y., to St. Lucie Inlet,

Fla., mouth Ochlockonee River, Franklin County, Fla., to NW Yucatán, Mexico. Major commercial fishery. Shallows to 35 m, occasionally 85 m. Summer only in north, rare (Pérez Farfante 1969; Lindner and Cook 1970).

### Superfamily Sergestoidea

#### Family Sergestidae

##### Subfamily Sergestinae

*Sergestes arcticus* Krøyer 1855. Associated with branches of North Atlantic Current from subarctic North Atlantic (70°N west of Greenland) southward to about 33°N, except about 20°N off W Africa near Cap Blanc; Mediterranean Sea; Southern Ocean, possibly circumglobal, between 32° and 62°S, but also reported off Angola and Gabon, W Africa. Pelagic, 20-1,463 m, usually 250-450 m (larvae 0-50 m); 2°-8°C, rarely 12.9°C, usually 3.5°-4.5°C (Squires 1963, 1966; Judkins 1972, by permission; Crosnier and Forest 1973; Omori 1974).

*Sergia robusta* (Smith 1882). Atlantic Ocean from southeast of Nova Scotia to Gulf of Mexico off Mississippi Delta, Martinique; Norwegian Sea (60°57'N) to Angola; Mediterranean Sea east to Crete. Records from Pacific are questionable. Pelagic, surface to 1,000+ m; only young near surface (larvae 0-50 m); population off Canary Islands concentrated at 700-800 m by day ascending to upper limit of 200 m at night (Foxton 1970; Judkins 1972, by permission; Omori 1974).

##### Subfamily Luciferinae

*Lucifer faxoni* Borradaile 1915. Atlantic Ocean; Nova Scotia to Rio de Janeiro, Brazil; off the Congo, W Africa; primarily in coastal waters. Surface to 90 m (Bowman and McCain 1967; Crosnier and Forest 1973).

### Suborder Pleocyemata

#### Infraorder Caridea

### Superfamily Oplophoroidea

#### Family Oplophoridae

*Acanthephyra pelagica* (Risso 1816). Atlantic Ocean from Davis Strait and Iceland southward to about 13°S, including Gulf of Mexico and Mediterranean Sea; also Atlantic Ocean south of 24°S; and in Indian and Pacific Oceans between 32°S and 57°S. 183-2,000+ m, ca. 4°C (Chace 1940; Sivertsen and Holthuis 1956; Squires 1963).

#### Family Nematocarcinidae

*Nematocarcinus rotundus* Crosnier and Forest 1973. W Atlantic from 40°N through Gulf of Mexico and West Indies to 16°54'S and perhaps farther south.

336-1,860 m and probably exceeding these limits (Crosnier and Forest 1973).

### Superfamily Pasiphaeidea

#### Family Pasiphaeidae

*Leptocheila carinata* Ortmann 1893. W Atlantic Ocean; Georges Bank off Massachusetts (41°22'N, 68°18'W) to Pará and Alagoas, Brazil. Surface to 100 m, 8.3°C (Coelho and Ramos 1972; Chace 1976).

*Pasiphaea multidentata* Esmark 1866. N Atlantic Ocean; Strait of Belle Isle to Cape Cod; off S Greenland to N Norway, southward along west coast of Europe and through Mediterranean Sea. 10 (rarely)-2,000 m, 3.5°-8°C (off eastern Canada) (Sivertsen and Holthuis 1956; Squires 1966).

*Pasiphaea tarda* Krøyer 1845. N Atlantic Ocean; easternmost entrance to Ungava Bay and SE Baffin Island to off South Carolina; Greenland through Norwegian Sea and south to Bay of Biscay; questionably off Angola (Crosnier and Forest 1973); also reported from Unalaska, Washington State, and Ecuador. 250-2,400 m, 1°-6°C (off eastern Canada) (Sivertsen and Holthuis 1956; Squires 1966).

### Superfamily Palaemonoidea

#### Family Palaemonidae

##### Subfamily Palaemoninae

*Leander tenuicornis* (Say 1818). Tropical and subtropical marine waters of world except west coast of Americas; Newfoundland Banks, Bay of Fundy, and New England to Falkland Islands in western Atlantic. Floating *Sargassum*, pilings, and submerged vegetation (Chace 1972).

*Palaemonetes (Palaemonetes) intermedius* Holthuis 1949\*. Long Island, N.Y., to Port Aransas, Tex. (published records from Vineyard Sound, Mass.). Estuaries, especially in submerged vegetation (Holthuis 1952).

*Palaemonetes (Palaemonetes) pugio* Holthuis 1949. Newcastle, Maine, and Yarmouth, Nova Scotia, to Corpus Christi, Tex. Estuaries, especially in submerged vegetation (Holthuis 1952; Williams 1974b).

*Palaemonetes (Palaemonetes) vulgaris* (Say 1818). W Gulf of St. Lawrence to Cameron County, Tex. (published records somewhat farther south). Estuaries, to 15 m, especially in submerged vegetation (Holthuis 1952; Williams 1974b).

### Superfamily Alpheoidea

#### Family Hippolytidae

*Bythocaris nana* Smith 1885. Off Martha's Vineyard to off Chesapeake Bay. 117-291 m, 12.1°-12.7°C (Holthuis 1947).

*Caridion gordonii* (Bate 1858). Bay of Fundy to Chesapeake Bay; N Norway and Iceland to Bay of Biscay. 5-421 m, 2.7°-10.5°C (Rathbun 1929; Holthuis 1947).

*Eualus fabricii* Krøyer 1841. W Greenland to Cape Cod; arctic Alaska to Cook Inlet; Siberian seacoast; Sea of Japan. 4-200 m,  $-1.5^{\circ}$ - $4.5^{\circ}$ C (Holthuis 1947; Squires 1963).

*Eualus gaimardii* (H. Milne Edwards 1837). Circumarctic southward to Cape Cod; North Sea (Kiel and Yarmouth); White Sea; Sitka, Alaska; Siberia. 10-900 m,  $-1.1^{\circ}$ - $3.8^{\circ}$ C (Holthuis 1947; Squires 1963).

*Eualus pusiolus* (Krøyer 1841). Gulf of St. Lawrence to off Cape Henry, Va.; Bering Island, Alaska Peninsula, and Aleutian Islands; San Juan Islands, Wash.; Iceland; Murman coast to Channel Islands; NE Spain. 1-500 m,  $-1.3^{\circ}$ - $10.5^{\circ}$ C (Holthuis 1947; Squires 1963).

*Hippolyte pleuracanthus* (Stimpson 1871). Connecticut to North Carolina. Beds of submerged vegetation (Chace 1972).

*Hippolyte zostericola* (Smith 1873). Woods Hole - Martha's Vineyard, Mass., North Carolina to Yucatán, Mexico; West Indies to Trinidad and Curaçao; Bermuda. Beds of submerged vegetation (Chace 1972).

*Latreutes fucorum* (Fabricius 1798). W North Atlantic between  $10^{\circ}$  and  $50^{\circ}$ N; Azores and Cape Verde Islands. Pelagic and sublittoral, in floating masses of *Sargassum* and submerged grasses (Chace 1972).

*Lebbeus groenlandicus* (Fabricius 1775). Greenland southward to Rhode Island; arctic Canada and Alaska; Bering Sea to Puget Sound; Sea of Okhotsk. 2-314 m,  $-1.3^{\circ}$ - $9.4^{\circ}$ C (Holthuis 1947; Squires 1963).

*Lebbeus polaris* (Sabine 1821). Circumarctic southward to off Chesapeake Bay; Bering Sea; Sea of Okhotsk; Skagerrak and Hebrides. <1-930 m,  $1.5^{\circ}$ - $8.9^{\circ}$ C (Holthuis 1947; Squires 1963).

*Lebbeus zebra* (Leim 1921) (closely resembles and may be identical with *L. microceros* (Krøyer 1841)). Port Burwell, Ungava; Gulf of St. Lawrence to SE Isles of Shoals ( $42^{\circ}52'N$ ,  $70^{\circ}20'W$ ). 10-91 m,  $8.2^{\circ}$ - $9.7^{\circ}$ C (Proctor 1933; Holthuis 1947; Squires 1963; Couture and Trudel 1968).

*Spirontocaris lilljeborgii* (Danielsen 1859). Greenland; Nova Scotia to off Delaware Bay; arctic Alaska; Iceland; Spitzbergen and Murman coast to south coast of England. 20-1,200 m,  $1.9^{\circ}$ - $8.9^{\circ}$ C (Holthuis 1947).

*Spirontocaris phippisii* (Krøyer 1841).\* Circumarctic, southward to near Martha's Vineyard; N Norway; Shumagin Islands, Alaska; Plover Bay, Siberia. 10-270 m,  $-1.5^{\circ}$ - $3.8^{\circ}$ C (Holthuis 1947; Squires 1963).

*Spirontocaris spinus* (Sowerby 1805). Circumarctic, southward to near Martha's Vineyard; North Sea; Bering Strait to Alaskan Peninsula; Hood Canal, near Union, Wash.; Siberian coast. 10-465 m,  $-1.4^{\circ}$ - $8.2^{\circ}$ C (Holthuis 1947; Squires 1963).

## Superfamily Pandaloidea

### Family Pandalidae

*Dichelopandalus leptocerus* (Smith 1881). Newfound-

land Banks to North Carolina; Shumagin Bank, Alaska. Surface-790 m,  $-0.1^{\circ}$ - $16.7^{\circ}$ C (Rathbun 1929; Squires 1963).

*Pandalus borealis* Krøyer 1838. Northern shrimp. Circumarctic; southward to off Martha's Vineyard, Mass.; Bering Sea, and stragglers to San Diego, Calif.; northern Europe including Britain; northern Japan. Major commercial fishery. 30-905 m,  $-1.4^{\circ}$ - $13.6^{\circ}$ C (Rathbun 1929; Rasmussen 1953; Wigley 1960; Squires 1963; Haynes and Wigley 1969; Scrivener and Butler 1971).

*Pandalus montagui* Leach 1813 or 1814. Striped pink shrimp. Greenland to Rhode Island; Iceland; northern Europe including British Isles. Minor commercial fishery. 5-790 m,  $-1.0^{\circ}$ - $21^{\circ}$ C, below  $10^{\circ}$ C in W Atlantic (Rathbun 1929; Squires 1963; Wigley 1960; Simpson et al. 1970).

*Pandalus propinquus* G. O. Sars 1869. Davis Strait; Newfoundland Banks to Delaware; Iceland; NW Europe. Minor commercial fishery. 20-2,000 m,  $2.6^{\circ}$ - $9.9^{\circ}$ C (Rathbun 1929; Squires 1963; Wigley 1960).

*Parapandalus willisi* L. H. Pequegnat 1970.  $39^{\circ}59'N$ ,  $70^{\circ}56'W$ , south of Martha's Vineyard; Gulf of Mexico to French Guiana. 150-500 m,  $7.2^{\circ}$ C (L. H. Pequegnat 1970).

*Plesionika edwardsii* (Brandt 1851).\* W Atlantic Ocean, south of Nantucket, Mass. ( $39^{\circ}55.5'N$ ,  $69^{\circ}38.5'W$ ); Bahamas, central W Atlantic; Gulf of Mexico; eastern Atlantic Ocean from southern Spain to Angola; Mediterranean; questionably from Indo-Pacific. 50-850 m (Crosnier and Forest 1973).

*Plesionika longipes* (A. Milne Edwards 1881). W Atlantic Ocean; SSE Nantucket, Mass. ( $39^{\circ}56'N$ ,  $69^{\circ}41'W$ ), through E Gulf of Mexico to Brazil. 360-457 m,  $8.2^{\circ}$ C (L. H. Pequegnat 1970).

*Plesionika martia* (A. Milne Edwards 1883). W Atlantic Ocean, south of Nantucket, Mass. ( $39^{\circ}55'N$ ,  $70^{\circ}22'W$ ), to Brazil, Bermuda; SW Ireland; Bay of Biscay to W and S Africa; Mediterranean; Aden and E Africa to Japan, Hawaii, New Zealand, and SE Australia. 165-2,100 m (Sivertsen and Holthuis 1956; Crosnier and Forest 1973).

## Superfamily Crangonoidea

### Family Glyphocrangonidae

*Glyphocrangon longirostris* (Smith 1882). Atlantic Ocean; east of Massachusetts to off Cape Hatteras, and questionably off Nicaragua and Surinam; southwest of Ireland to South Africa off Cape Point. 640-2,295 m (Holthuis 1971).

### Family Crangonidae

*Argis dentata* (Rathbun 1902). Smith Sound, NW Greenland through arctic Canadian islands to Dease Strait and southward to south-southwest of Nova

Scotia; Bering Sea to Sitka and SE coast of Kamchatka. 0-320 m,  $-1.6^{\circ}$ - $-6.9^{\circ}$ C (Squires 1963, 1966; Couture and Filteau 1971).

*Crangon (Crangon) septemspinosa* Say 1818. Sand shrimp. Baffin Bay to E Florida; arctic Alaska to Shumagin Islands; Sea of Okhotsk; Hokkaido, Japan. Sandy bottom, low tide mark to about 150+ m, rarely 450 m,  $<0^{\circ}$ - $-28.3^{\circ}$ C (Price 1962; Squires 1963; Zarenkov 1965).

*Metacrangon jacqueti agassizii* (Smith 1882). W Atlantic Ocean from SE Newfoundland ( $42^{\circ}15'N$ ,  $65^{\circ}48'W$ ), to off Fernandina, Fla. ( $30^{\circ}47'N$ ,  $79^{\circ}49'W$ ). 223-4,062 m,  $3.7^{\circ}$ - $-6.0^{\circ}$ C (Sivertsen and Holthuis 1956; Crosnier and Forest 1973; USNM records).

*Pontophilus brevirostris* Smith 1881. Gulf of Maine to Gulf of Mexico off Cuba. 25-350 m,  $4.9^{\circ}$ - $-12.6^{\circ}$ C (Williams 1974b).

*Pontophilus norvegicus* (M. Sars 1861). Greenland to Maryland and points southeast ( $38^{\circ}41'N$ ,  $73^{\circ}06'W$ ); Iceland; Spitzbergen; NW Europe; Balearic Islands; 50-945 m,  $0.6^{\circ}$ - $-10.5^{\circ}$ C (Rathbun 1929; Squires 1963; Forest 1965).

*Sabinea hystrix* (A. Milne Edwards 1881). W Atlantic Ocean from Davis Strait and southwest of Iceland to Guadeloupe; E Atlantic off Rio de Oro, Spanish Sahara. 550-3,600 m;  $0^{\circ}$ - $-5.5^{\circ}$ C (Squires 1966; Crosnier and Forest 1973).

*Sabinea sarsii* Smith 1879. Davis Strait to ESE Nantucket ( $40^{\circ}01'N$ ,  $65^{\circ}53'W$ ); Iceland; N Europe. 48-710 m,  $0.6^{\circ}$ - $-8.9^{\circ}$ C (Rathbun 1929; Squires 1963).

*Sabinea septemcarinata* (Sabine 1824). Mouth St. Lawrence River to Massachusetts Bay; Arctic Ocean to Pt. Barrow, Alaska; White sea and N Europe. 10-271 m (to 340 m in cod stomachs),  $-1.4^{\circ}$ - $-7.4^{\circ}$ C (Rathbun 1929; Squires 1963).

*Sclerocrangon boreas* (Phipps 1774). Arctic Ocean southward to Cape Cod, and SE Nantucket ( $40^{\circ}16'N$ ,  $67^{\circ}26'W$ ); Aleutian Islands and Alexander Archipelago, Alaska; NE Siberia. 1-260 m,  $-1.5^{\circ}$ - $-7.8^{\circ}$ C (Rathbun 1929; Squires 1963; Zarenkov 1965).

### Infraorder Astacidea

#### Superfamily Nephropoidea

##### Family Nephropidae

###### Subfamily Thymopinae

*Nephropsis aculeata* Smith 1881. Florida lobsterette. South of Martha's Vineyard ( $40^{\circ}04'N$ ,  $70^{\circ}20'W$ ), through Gulf of Mexico and Caribbean Sea to French Guiana. Usually on mud or fine sand bottom, 38-1,692 m, but mostly 300-500 m,  $5.8^{\circ}$ - $-10.4^{\circ}$ C (Holthuis 1974).

###### Subfamily Nephropinae

*Homarus americanus* H. Milne Edwards 1837. American lobster. Labrador to North Carolina. Ma-

lor commercial fishery. Near low tide mark to about 700 m, at least  $-1^{\circ}$ - $-24.3^{\circ}$ C (Herrick 1896; Templeman and Tibbo 1945; Lewis 1970; Williams 1974b; Holthuis 1974).

### Infraorder Palinura

#### Superfamily Eryonoidea

##### Family Polychelidae

*Eryoneicus* sp. Larval stage.  $39^{\circ}52'N$ ,  $69^{\circ}24'W$ , 1,330 m,  $4.3^{\circ}$ C.

*Stereomastis sculpta sculpta* (Smith 1880). Atlantic Ocean south of Iceland through Gulf of Mexico into West Indies, Cape Verde Islands and W Africa to Angola; Arabian Sea and Malay Archipelago. Bottoms of continental slope, rarely 146, 230-4,000 m,  $4.3^{\circ}$ - $-5.0^{\circ}$ C (Firth and Pequegnat 1971; Sivertsen and Holthuis 1956).

#### Superfamily Palinuroidea

##### Family Scyllaridae

*Scyllarides nodifer* (Stimpson 1886). \* Spanish lobster. S Long Island ( $39^{\circ}11'N$ ,  $71^{\circ}56'W$ ); North Carolina to Cuba, Gulf of Mexico, and Yucatan; Bermuda. 2-91 m. Postlarvae from northern limit in lancetfish (*Alepisaurus*) stomach. (Lyons 1970).

*Scyllarus depressus* (Smith 1881). Off Martha's Vineyard and ESE Nantucket ( $40^{\circ}32'N$ ,  $67^{\circ}02'W$ ), through Gulf of Mexico and Caribbean Sea to São Paulo, Brazil. 29-422 m,  $6.0^{\circ}$ - $-8.6^{\circ}$ C. Postlarvae only north of Cape Hatteras (Lyons 1970).

### Infraorder Anomura

#### Superfamily Thalassinoidea

##### Family Axiidae

*Axius serratus* Stimpson 1852. Bay of Fundy to Long Island Sound. 1-320 m,  $3.7^{\circ}$ - $-12.2^{\circ}$ C (Rathbun 1929).

*Calocaris templemani* (Squires 1965). (Greenland?); Hermitage Bay, Newfoundland; Gulf of Maine. 64-261 m,  $3.7^{\circ}$ - $-6.8^{\circ}$ C. (de Saint Laurent 1972a; Williams 1974b).

##### Family Laomediidae

*Naushonia crangonoides* Kingsley 1897. \* Bass River, Vineyard Sound, and Elizabeth Islands, Mass. Channels near shore.

##### Family Callianassidae

*Callianassa atlantica* Rathbun 1926. Bass River, Nova Scotia, to Sapelo Island, Ga.; Franklin County, W Fla. Muddy shores and shallow littoral to 40 m (Schmitt 1935; = *Callichirus*, de Saint Laurent 1973).

*Callianassa bifurcata* Biffar 1971. Bass River, Yarmouth, and Nantucket Sound, Mass.; Chesapeake Bay?; South Edisto Island, S.C., to McIntosh County, Ga.; Franklin County, Fla. Intertidal to occasionally subtidal (Biffar 1971).

#### Family Upogebiidae

*Upogebia affinis* (Say 1818). Cape Cod Bay (Wellfleet, Mass.) to Rockport, Tex.; through West Indies to Maceió, Alagoas, Brazil. Burrows in estuarine littoral; intertidal to 25 m (Williams 1965).

#### Superfamily Paguroidea

##### Family Paguridae

##### Subfamily Pagurinae

*Catapagurus gracilis* (Smith 1881). W Atlantic Ocean, Massachusetts to Barbados. 73-418 m, 3.9°-13.1°C (Milne Edwards and Bouvier 1894; USNM records).

*Catapagurus sharreri* A. Milne Edwards 1880. W Atlantic Ocean about 40°N southward through Caribbean Sea to near Rio de Janeiro, Brazil (23°08.5'S, 42°30'W). 60-882 m, 4.9°-12.6°C (Forest and de Saint Laurent 1967).

*Pagurus acadianus* Benedict 1901. Grand Banks of Newfoundland and Gulf of St. Lawrence to near Cape Hatteras (35°41'N; 75°07'W). Low water mark to 485 m, usually less than 100 m, 0.7°-13.9°, rarely 23.9°C (Rathbun 1929).

*Pagurus annulipes* Stimpson 1860. Vineyard Sound, Mass., to Beaufort, N.C., possibly to NE Florida; Cedar Key, Fla., to Texas. Variety of bottoms, but predominantly on sand, near shore and estuaries to 40 m, 9.9°C (Williams 1965; Rouse 1970).

*Pagurus arcuatus* Squires 1964. Greenland to off Ocean City, Md. Low water mark to 270 m, -0.1°-28.3°C (Squires 1963).

*Pagurus longicarpus* Say 1817. Minas Basin, Nova Scotia, to NE Florida; Sanibel Island, Fla., to Texas. Shallow littoral of ocean and estuaries on variety of bottoms to 51 m, 7.6°-18.3°C (Williams 1965).

*Pagurus politus* (Smith 1882). Georges Bank to off Dry Tortugas, Fla. 10-1,170 m, 7°-18.3°C.

*Pagurus pollicaris* Say 1817. Nantucket Sound, Mass., to NE Florida; Key West, Fla., to Texas. Ocean and mouths of estuaries, low tide mark to 73 m, 7.9°-17.8°C (Williams 1965).

*Pagurus pubescens* Krøyer 1838. West Greenland, Foxe Basin, and Hudson Bay to New Jersey; Spitzbergen, Novaya Zemlya, and Barents Sea to Faeroes, Hebrides, England (except S coast), and SW Ireland. 6-600 m, rarely 984 m, 1.6°-12.8°C (Rathbun 1929; Squires 1964).

#### Family Parapaguridae

*Parapagurus pilosimanus pilosimanus* Smith 1879. Atlantic, W Indo-Pacific (?) Oceans, 210-2,000 m, 4.2°-

6.9°C (de Saint Laurent 1972b). Two other subspecies are recognized from 2,000 m, and deeper in the Atlantic.

#### Family Lithodidae

*Lithodes maja* (Linnaeus 1758). Greenland to Sandy Hook, N.J.; Spitzbergen to Belgium and Isle of Man. 65-600 m, 1.0°-9.7°C (Rathbun 1929; Bouvier 1940; Squires 1963).

*Neolithodes grimaldii* (Milne Edwards and Bouvier 1894). Iceland and Davis Strait, off Greenland, to off Nantucket; Azores. 329-2,000 m, ca. 2.0°C (Milne Edwards and Bouvier 1894; Squires 1963, 1966).

#### Superfamily Galatheaidea

##### Family Chirostylidae

*Eumunida picta* Smith 1884. Atlantic Ocean, ESE Nantucket (40°20'N, 67°30'W) through Gulf of Mexico and Caribbean Sea to Surinam; W Africa off Cape Verde Islands and Cape Bojador; Pacific Ocean, Australia, and New Zealand. 150-600 m, 10.0°-10.9°C (Gordon 1929; Chace 1942; Pequegnat et al. 1971).

##### Family Galatheaidea

*Munida iris* A. Milne Edwards 1880. Off Georges Bank (43°20'N, 60°29'W) through SE Gulf of Mexico to off Isla de Cozumel, Quintana Roo; off mouth of Amazon River; Spanish Sahara, Canary and Cape Verde Islands. 70-730 m, 3.9°-14.4°C (Chace 1942; Miyake and Baba 1970).

*Munida valida* Smith 1883. Georges Bank (41°20'N, 66°05'W) to Golfo de Morrosquillo, Colombia, and Curaçao. 90-825 m, 5.0°C (Chace 1942).

##### Family Porcellanidae

*Polyonyx gibbesi* Haig 1956. Woods Hole, Mass., to Alligator Harbor, Fla.; Puerto Rico; Panama; Brazil; Uruguay. Commensal with *Chaetopterus variopedatus*, intertidal to 15 m (Coelho and Ramos 1972; Williams 1965).

*Porcellana sigsbeiana* A. Milne Edwards 1880.\* Off Martha's Vineyard, Mass., to Gulf of Mexico off Yucatán, Mexico; West Indies to Virgin Islands. 50-390 m (Williams 1965).

#### Superfamily Hippoidea

##### Family Hippidae

*Emerita talpoida* (Say 1817). Mole crab, sand bug. SE Barnstable County, Cape Cod, Mass., to E coast of Florida; W coast of Florida to Grand Isle, La.; Progreso, Yucatán, Mexico. Wave washed sandy beaches and below surf line to 3.5 m (Williams 1965).

## Infraorder Brachyura

### Section Dromiacea

#### Superfamily Homoloidea

##### Family Homolidae

*Homola barbata* (Fabricius 1793). Off SE Massachusetts to Caribbean Sea; E Atlantic from Portugal and Azores to Madeira Islands; Mediterranean Sea; South Africa. 55-685 m, 10.6°-14.6°C (Williams 1965).

### Section Oxystomata

#### Superfamily Dorippoidea

##### Family Dorippidae

##### Subfamily Dorippinae

*Ethusa microphthalma* Smith 1881. Off Martha's Vineyard, Mass., to Cuba and through Gulf of Mexico. Rarely <20 m, 109-575 m, 12.8°C (Fowler 1951; Rathbun 1937; W. E. Pequegnat 1970; Pequegnat et al. 1971).

#### Superfamily Calappoidea

##### Family Calappidae

##### Subfamily Calappinae

*Acanthocarpus alexandri* Stimpson 1871. Georges Bank to W coast of Florida; Puerto Rico to Grenadines; Brazil. 70-380 m (Williams 1965).

*Calappa flammea* (Herbst 1794). \* Falmouth and south of Nantucket, Mass., through Bahamas and Gulf of Mexico; Bermuda. Surface to 73 m, rarely to 230 m (Rathbun 1937; Williams 1965).

##### Family Leucosiidae

*Myropsis quinquespinosa* Stimpson 1871. Massachusetts to Venezuela. 91-1,048 m (Williams et al. 1968).

*Persephona mediterranea* (Herbst 1794) (= *punctata aquilonaris* Rathbun). \* New Jersey to Brazil. 37-55 m (Guinot-Dumortier 1959).

### Section Oxyrhyncha

#### Family Majidae

##### Subfamily Inachinae

*Collodes robustus* Smith 1881. North of Cape Cod, Mass. (42°12'N, 70°13'W), to off Cape Hatteras, N.C. 27-682 m, 3.5°-13.1°C (Rathbun 1925).

*Euprognatha rastellifera* Stimpson 1871. Off Georges Bank to S Gulf of Mexico; West Indies to Grenada and Barbados. 25-710 m, 3.9°-12.6°C. Rathbun (1925) recognized a blunt spined northern subspecies, *marthae*, ranging from New England to the Florida Keys (Williams 1965).

## Subfamily Oregoniinae

*Chionoecetes opilio* (O. Fabricius 1788). Snow crab. NW Atlantic Ocean southward to St. Lawrence estuary and Gulf of Maine; arctic Alaska and NE Siberia through Bering Strait to Alaskan Peninsula and Aleutian Islands, Kamchatka, Okhotsk Sea, and southward to Japan. Limited N Pacific and W Atlantic commercial fishery. 0-640 m, rarely to 2,222 m, -1°-4°C (Garth 1958; Squires 1966; Watson 1970).

*Hyas araneus* (Linnaeus 1758). W Greenland; Labrador to Rhode Island; between Greenland and Iceland, through British Isles and NW France to Spitzbergen and W Kara Sea. <1-360 m, usually <50 m, -1.3°-14.8°C, hard and soft bottom (Hartnoll 1963; Squires 1963; Christiansen 1969).

*Hyas coarctatus* Leach 1815. Typical subspecies from Labrador to North Carolina; between Greenland and Iceland, through British Isles, NW and SW France, to Spitzbergen and E Barents Sea. <1-1,650 m, hard and soft bottom, -1.4°-14.8°C (Hartnoll 1963; Squires 1963; Christiansen 1969).

## Subfamily Pisinae

*Libinia dubia* H. Milne Edwards 1834. Cape Cod, Mass., to S Texas; Bahamas and Cuba. Ocean and polyhaline portions of estuaries on a variety of substrates from low tide mark to 45 m (Williams 1965).

*Libinia emarginata* Leach 1815. Windsor, Nova Scotia, to W Gulf of Mexico. Ocean and high salinity estuaries on a variety of substrates from near low tide mark to 50 m, rarely to 125 m (Williams 1965).

*Pelvia mutica* (Gibbes 1850). Buzzards Bay and Vineyard Sound, Mass., to W coast of Florida; Cuba to St. Thomas. Estuarine and oceanic sublittoral on coarse substrate and encrusted pilings, low water mark to 50 m (Williams 1965).

*Rochinia crassa* (A. Milne Edwards 1879). Off Nantucket Shoals, Mass., to W Gulf of Mexico. 128-610 m, 8.1°C (Pequegnat et al. 1971; Williams et al. 1968).

*Rochinia tanneri* (Smith 1883). Off Martha's Vineyard, Mass., to Straits of Florida. 128-708 m (Williams et al. 1968).

## Family Parthenopidae

### Subfamily Parthenopinae

*Heterocrypta granulata* (Gibbes 1850). \* Nantucket Sound, Mass., to Georgia; Florida Straits to Sabine, Tex.; through West Indies to Trinidad. Shingle and shelly substrate of estuarine and oceanic littoral, 3.5-135 m (Williams 1965).

*Parthenope (Platylambrus) pourtalesii* (Stimpson 1871). SSE Nantucket, Mass., through West Indies to Grenada. Predominantly on sand or sandy mud, 20-250 m, 10.2°-12.2°C but exceeding these limits (Williams 1965).

## Section Cancridea

### Family Cancridae

#### Subfamily Cancrinae

*Cancer borealis* Stimpson 1859. Jonah crab. Nova Scotia to south of Tortugas, Fla.; Bermuda. Minor commercial fishery. On various substrates, intertidal to 800 m; shallower in north than in south, some seasonal movement, 1.3°-14.4°C but exceeding at least upper limit (Williams 1965; Jeffries 1966; Nations 1975).

*Cancer irroratus* Say 1817. Rock crab. Labrador to off Miami, Fla. Minor commercial fishery. On various but usually coarse substrates, low water mark to 575 m; shallower in north than in south, some seasonal movement, 1.3°-25°C (Squires 1963; Williams 1965; Jeffries 1966).

## Section Brachyrhyncha

### Superfamily Portunoidea

#### Family Portunidae

##### Subfamily Polybiinae

*Bathynectes superbus* (Costa 1838). Martha's Vineyard, Mass., to Yucatán Channel; off Norway, Shetland and Faeroe Islands, to Angola; Mediterranean Sea. 100-1,455 m, 7.0°-10.9°C (Christiansen 1969).

*Benthochascon schmitti* Rathbun 1931. South of Nantucket, Mass. (40°02'N, 70°18'W); Gulf of Mexico. Primarily a slope species; 201-510 m. Bottom water temperature 10.4°C. Sediment olive brown silt-clay. (W. E. Pequegnat 1970; Pequegnat et al. 1971; Wigley and Messersmith 1976).

*Ovalipes ocellatus* (Herbst 1799). Prince Edward Island, Canada, to Florida; possibly Texas coast. Variety of substrates but especially on sand. Surface to 95 m, 7.8°-23.9°C but exceeding these limits elsewhere (Williams 1965; Felder 1973).

##### Subfamily Portuninae

*Arenaeus cribrarius* (Lamarck 1818). \* Vineyard Sound, Mass., to Santa Catarina, Brazil. Usually in or near waves and shifting sand along ocean beaches. Water line to 70 m (Williams 1965).

*Callinectes sapidus* Rathbun 1896. Blue crab. Nova Scotia to Mar del Plata, Argentina; Bermuda. Introduced in Mediterranean and Baltic Seas and Japan. Major commercial fishery. Variety of substrates in rivers, estuaries, and shallow oceanic littoral to 40 m (Chace and Hobbs 1969; Williams 1974a; T. Sakai, in litt.).

*Callinectes similis* Williams 1966. \* Lesser blue crab. Cape May, N.J., to off Soto La Marina, Tamaulipas, Mexico. Usually oceanic; water's edge to 35-40 m, occasionally to 80 m, once at surface over a 1,685-m depth (Williams 1974a).

*Carcinus maenas* (Linnaeus 1758). Green crab. Nova Scotia to Virginia; Iceland; Faeroe Islands;

Kvaenangen, Norway, southward including parts of S Baltic Sea, British Isles and Portugal; Mauritania; Australia. Probably introduced in United States and Australia and temporarily elsewhere. On variety of substrates in estuarine and oceanic shallow littoral. Intertidal to 62 m, rarely 200 m, 2.6°-15.6°C but exceeding this range elsewhere (Christiansen 1969).

*Portunus gibbesii* (Stimpson 1859). Southern Massachusetts to Texas; Venezuela; Surinam. Surface to 90 m, seldom deeper (Williams 1965).

*Portunus sayi* (Gibbes 1850). Nova Scotia through Gulf of Mexico to Brazil; Bermuda and mid-Atlantic Ocean; Kerguelen Island. Usually pelagic among floating *Sargassum* (Williams 1965).

*Portunus spinimanus* Latreille 1819. New Jersey through Gulf of Mexico and West Indies to southern Brazil; Bermuda. On beaches under *Sargassum* to 90 m (Williams 1965).

### Superfamily Xanthoidea

#### Family Xanthidae

*Eurypanopeus depressus* (Smith 1869). Massachusetts Bay and Provincetown, Mass., through Florida to Texas; Bermuda; West Indies. Mainly oyster bars in estuaries; oceanic littoral. Low water mark to 50 m (Williams 1965).

*Hexapanopeus angustifrons* (Benedict and Rathbun 1891). Vineyard Sound, Mass., to Port Aransas, Tex.; Bahamas; Jamaica. Shelly substrates in high salinity estuaries, but mainly oceanic. Nearshore to 140 m (Williams 1965).

*Neopanope sayi* (Smith 1869). Miramichi Bay, Prince Edward Island, and Cape Breton Island, New Brunswick, to north of Melbourne, Brevard Co., E Fla. Introduced Sawnea, Wales. Various substrates, but mainly mud in estuaries. Low tide mark to 37 m, 11.1°-18.3°C but exceeding these limits (Williams 1965; Abele 1972; Grizzle 1974).

*Panopeus herbstii* H. Milne Edwards 1834. Boston (?), Woods Hole, Mass., to Uruguay; Bermuda. Variety of substrates, estuarine and oceanic. Intertidal to 20 m (Williams 1965; Chace and Hobbs 1969).

*Rhithropanopeus harrisi* (Gould 1841). \* Original range, estuaries from New Brunswick, Canada, to Veracruz, Mexico; NE Brazil. Introduced, Coos Bay, Oreg., and San Francisco Bay, Calif.; northwest Europe, Black and Caspian Seas. Water's edge to 35 m (Gadzhiev 1963; Williams 1965; Christiansen 1969).

#### Family Geryonidae

*Geryon quinquegens* Smith 1897. Deep sea red crab. Gulf of Maine to SE Mar del Plata, Argentina. Minor commercial fishery. 66-2,160 m, greatest in number and density from 320 to 914 m off New England; young in water 3.6°-5.5°C, adults in warmer water to 12.7°C, population most dense at

5°-8°C (Rathbun 1937; Scelzo and Valentini 1974; Wigley et al. 1975).

## Family Pinnotheridae

*Dissodactylus mellitae* (Rathbun 1900). Vineyard Sound, Mass., to Charleston, S.C.; west Florida. Commensal with sand dollars. Shallow water to 20 m (Williams 1965).

*Pinnixa chaetoptera* Stimpson 1860. Cape Cod Bay, Mass., to Rio Grande do Sul, Brazil. Commensal with polychaetes (*Chaetopterus variopedatus*, *Amphitrite ornata*), and *Callianassa* species. Intertidal to 20 m (Schmitt et al. 1973).

*Pinnixa cylindrica* (Say 1818). North Falmouth, Mass., to Alligator Harbor, Fla. Commensal with *Arenicola cristata*, and probably other large annelids. Shallow water to 36.6 m (Schmitt et al. 1973).

*Pinnixa sayana* Stimpson 1860. Cape Cod Bay, Mass., to Beaufort, N.C.; Sarasota Bay, Fla.; Grand Isle, La.; Brazil. Reported as living free in mud. Shore to 47.5 m (Schmitt et al. 1973).

*Pinnotheres maculatus* Say 1818. Mussel crab. Cape Cod, Mass., to Mar del Plata, Argentina. Parasitic in bivalve mollusks and in tubes of polychaetes, as well as free-swimming stages. Surface to 238 m (Schmitt et al. 1973).

*Pinnotheres ostreum* Say 1817. Oyster crab. Salem, Mass., to Santa Catarina, Brazil. Parasitic in bivalve mollusks, *Argopecten* sp., *Anomia simplex*, *Crassostrea virginica*, *Mytilus edulis*, *Modiolus demissus*, and with the polychaete *Chaetopterus variopedatus*, as well as free-swimming stages in estuaries. Depth limits not recorded (Sandifer and Van Engel 1970; Schmitt et al. 1973).

## Family Grapsidae

### Subfamily Grapsinae

*Planes minutus* (Linnaeus 1758). Gulf weed crab, turtle crab, Columbus crab. Atlantic Ocean south of Newfoundland, west of lat. 50°W, and exclusive of Gulf of Mexico; occasionally on coast of Netherlands, SW England, Portugal, and Mediterranean Sea. Common in *Sargassum* (Chace 1951; Christian-sen 1969).

### Subfamily Sesarminae

*Sesarma reticulatum* (Say 1817). Woods Hole, Mass., to Calhoun County, Tex., except S Florida. Burrows in muddy salt marshes (Williams 1965; Abele 1973).

## Superfamily Ocypodoidea

### Family Ocypodidae

#### Subfamily Ocypodinae

*Ocypode quadrata* (Fabricius 1787). Ghost crab.

Woods Hole, Mass., to Santa Catarina, Brazil. Semiterrestrial; burrows along ocean beaches and occasionally on harbor beaches (Williams 1965; Chace and Hobbs 1969).

*Uca minax* (Le Conte 1855). Red jointed fiddler. Silver Springs, Cape Cod, Mass., to NE Florida; Yankeetown, NW Fla., to Louisiana. Usually on muddy or muddy sand substrates of low salinity marshes; a burrower (Crane 1975).

*Uca pugilator* (Bosc 1801 or 1802). Sand fiddler. Near Truro, Cape Cod, Boston Harbor, Mass., to Corpus Christi, Tex. Sheltered sandy and muddy beaches bordering marshes and tidal creeks; a burrower (Crane 1975).

*Uca pugnax* (Smith 1870). Mud fiddler. Provincetown, Mass., to near Daytona Beach, Fla. Primarily on intertidal mud flats among *Spartina*; a burrower (Crane 1975).

### Subfamily Uncertain

#### Family Palicidae

*Palicus gracilis* (Smith 1883). Off Martha's Vineyard, Mass., through Gulf of Mexico to off Curaçao. 183-512 m, 8.3°-10.4°C (Rathbun 1918).

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