DECAPOD CRUSTACEA OF THE CALANUS EXPEDITIONS IN UNGAVA BAY, 1947-1950

by

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Abstract

The decapod fauna of Ungava Bay (17 species, 3,000 specimens collected) is shown to be similar to that of the shallow water areas of West Greenland. Four species are reported for the first time from Ungava Bay: Sergestes arcticus and Pasiphaea tarda, ordinarily from deeper and warmer water, and Eualus macilentus and Sabinea septemcarinata. Systematics of each species is treated under occurrence, world distribution and taxonomy. Lengths of most species of shrimp showed that a greater size was reached in females than in males. Maturities with respect to size when first mature, egg size and times of hatching and spawning are discussed. Males were found to be mature at a size smaller than first-mature females. The high percentage of stations at which decapods, including larvae, were taken, and their occurrence in the stomachs of many seals and fish attest their prevalence and their importance in the bionomics of the area.

C O N T E N T S

Introduction

Previous to the work of the Calanus Expeditions, 1947-1950, in Ungava Bay, few collections of decapods had been made in this area. A synopsis of the species and by whom they were taken is as follows:

Dr. Robert Bell, in 1884, took the following decapods in dredgings at Port Burwell (Smith, 1885):

4	Eupagurus krøyeri Stimpson	= Pagurus krøyeri
1F	Ceraphilus boreas (Phipps)	= Sclerocrangon boreas
2F	Hippolyte fabricii (Krøyer)	= Eualus fabricii
1M, 11F	H. phippsii (Krøyer)	= Spirontocaris phippsi
8M, 7F	H. groenlandicus (J. C. Fabricius)	= Lebbeus groenlandicus
5M, 11F	H. polaris (Sabine)	= L. polaris
1F	Pandalus montagui Leach	

A collection by Lucien M. Turner in 1882-1885, in Ungava Bay, comprised the following species (Rathbun, 1913):

Sclerocrangon boreas (Phipps)	
Spirontocaris polaris (Sabine)	= Lebbeus polaris
S. fabricii (Krøyer)	= Eualus fabricii

In 1884, A. P. Low made dredgings "on the south side of Hudson Strait, between King George Sound and the bottom of Ungava Bay" (Whiteaves, 1901). Whiteaves, however, reported only Pandalus montagui from Hudson Strait as being from Low's collection. No further reference to Low's collection has been seen by the present author.

The Diana Expedition, 1897, collected in Ungava Bay the following species (Rathbun, 1919):

3 Pagurus krøyeri Stimpson

1 Hyas coarctatus Leach

The Neptune Expedition, 1903-1904, took the following species at Port Burwell (Rathbun, 1919):

12 Spirontocaris groenlandicus (Fabricius) = Lebbeus groenlandicus

1 S. spina (Sowerby) = S. spinus

1 S. liljeborgi (Danielssen)

23 S. phippsi (Krøyer)

6 S. polaris (Sabine) = Lebbeus polaris

17 S. fabricii (Krøyer) = Eualus fabricii

20 S. gaimardi (Milne-Edwards) (varying toward S. g. belcheri) = E. gaimardi and E. g. belcheri

1 Sclerocrangon boreas (Phipps)

Nectocrangon lar (Krøyer) = Argis dentata Rathbun

The Calanus Expeditions, 1947-1950, in Ungava Bay, took 17 species in all, which comprise, in addition to the species collected previously in this area, the following four species:

Sergestes arcticus Krøyer

Pasiphaea tarda Krøyer

Eualus macilentus (Krøyer)

Sabinea septemcarinata (Sabine)

In addition, the Calanus Expeditions collected larvae of species mentioned in the families Pandalidae, Hippolytidae (most species) and Crangonidae (except Sclerocrangon), as well as larvae of Pagurus krøyeri and Hyas coarctatus.

A more recent collection (August 9-28, 1954) of decapods from Brunnich's murre food to young on Akpatok Island, Ungava Bay, yielded the following species (Tuck and Squires, 1955):

7 Pandalus montagui Leach

14 Lebbeus polaris (Sabine)

1 L. groenlandicus (Fabricius)

1 Spirontocaris spinus (Sowerby)

55 Argis dentata Rathbun

Areas adjacent to Ungava Bay have been collected in very extensively to the east (Davis Strait, Baffin Bay and, particularly, West Greenland) but less extensively to the west (Hudson Bay). Some species collected in Hudson Bay and Strait to which Whiteaves (1901) refers are:

Pandalus montagui. Bell and Low.

Spirontocaris phippsi. Bell.

Sclerocrangon boreas. Bell.

Hyas coarctatus. Preble, 1900 (Rathbun, 1925).

The Neptune Expedition (1903-1904) also collected in Hudson Bay the following species (Rathbun, 1919):

Lebbeus groenlandicus

L. polaris

Eualus fabricii

E. gaimardi

West Greenland and adjacent areas have been explored very extensively, and decapod species were collected by the Alert (British Arctic Expedition, 1875-1876), Ingolf Expedition (1895-1896), the Godthaab Expedition (1928), Treaarexpeditionen til Christian d. X's Land (1931-1934), 6th. and 7th. Thule Expeditions (1933) and Dana Expedition (1933), and were taken in many other smaller collections, all of which are reviewed by Hansen (1908), Stephensen (1935), and Heegard (1941). Species collected from West Greenland, Davis Strait and Baffin Bay may be separated according as to whether they were taken in shallow or deep water as follows:

Shallow water species:	Depths — metres.
Pandalus montagui	64
Lebbeus microceros	...
L. groenlandicus	0 - 50
L. polaris	4 - 350
Spirontocaris phippsi	4 - 70
S. liljeborgi	12 - 16
S. spinus	8 - 50

Shallow water species (concl.):		Depths - metres.
Eualus fabricii		4 - 56
E. gaimardi (incl. E. g. belcheri)		12 - 100
E. macilentus		16 - 100
Sabinea septemcarinata		10 - 100
Argis dentata		0 - 100
Sclerocrangon boreas		0 - 150
Pagurus pubescens		0 - 200
Hyas araneus		60 - 160
Hyas coarctatus		0 - 150
Chionoecetes opilio		- 160
Deep water species:		
Sergestes arcticus	(pelagic)	500 - 1600
Gennadas elegans	(")	500 - 2800
Hymenodora glacialis	(")	250 - 2000
Parapasiphaea sulcatifrons	(")	1000 - 2700
Pasiphaea tarda	(")	800 - 1200
Ephyrina benedicti	(")	300 - 3500
Acanthephyra multispina	(")	300 - 3000
Pandalus propinquus		600 - 1400
P. borealis		150 - 700
Bythocaris gracilis		700

Deep water species (concl.):	Depths -- metres.
Bythocaris leucopis	140 - 500
B. payeri	450 - 820
Pontophilus norvegicus	500 - 800
Sabinea sarsi	150 - 200
S. hystrix	750 - 1100
Sclerocrangon ferox	450 - 880
Polycheles nanus	1600
Munidopsis antoni	2400
M. curvirostra	650 - 750
Munida tenuimana	500 - 1200
Lithodes maja	140 - 550
Neolithodes grimaldi	1000

It may be seen that almost all the shallow water species from West Greenland were also taken in Ungava Bay: except Lebbeus microceros, Pagurus pubescens (Hansen, 1908, believes this to be synonymous with P. krøyeri), Hyas araneus and Chionoecetes opilio. However, the deep water pelagic species, Pasiphaea tarda and Sergestes arcticus, were taken in shallower waters than reported heretofore, near the entrance to Ungava Bay by the Calanus Expeditions, 1947-1950.

Key to species

The following key to species collected, and allied species which occur in areas adjacent to Ungava Bay, has been compiled from several sources (chiefly: Sund, 1912; Schmitt, 1921; Rathbun, 1929; Holthuis, 1947), and include some minor points observed in the specimens examined. The inclusion of numbers of epipods on periopods, or presence of exopod on the 3rd. maxilliped in some species has been made because separation of species is often not otherwise possible in damaged specimens from stomach contents.

A. Body laterally compressed. Pleopods used for swimming.

Suborder NATANTIA.

I. First 3 pairs of periopods chelate; pleura of 2nd. segment of abdomen not overlapping those of the 1st. or 2nd. segments.

Tribe PENEIDEA.

1. Last 2 pairs of periopods well-developed.

Family Peneidae.

2. Last one or 2 pairs of periopods reduced in size, rudimentary or wanting. Family Sergestidae.

a. Rostrum very short. One antennular flagella very long, the other very short. First joint of antennular peduncle much longer than the third. Sergestes arcticus.

II. First 2 pairs of periopods chelate; pleura of 2nd. segment of abdomen overlapping those of the 1st. and 2nd. segments.

Tribe CARIDEA.

Tribe Caridea (cont.)

3. Rostrum short or wanting, represented by a postfrontal spine or tooth. Exopods on all periopods.

Family Pasiphaeidae.

a. Long spine on scaphocerite; basis of 2nd. periopod with 7 to 12 spines. Pasiphaea multidentata.

b. Short spine on scaphocerite; basis of 2nd. periopod with 1 to 4 spines. Pasiphaea tarda.

4. Rostrum laterally compressed, long, armed above with spines, moveable for the most part, and below with fixed teeth. First 2 pairs of periopods greatly unequal, carpus of 2nd. pair annulated. Family Pandalidae.

a. Third abdominal segment somewhat carinated dorsally and armed with a short spine or lobe. Carpus of right 2nd. periopod with about 25 annulations. Pandalus borealis.

b. Third abdominal segment without carina or lobe or spine.

i. Carpus of right 2nd. periopod with about 5 annulations. Pandalus propinquus.

ii. Carpus of right 2nd. periopod with about 20 annulations. Pandalus montagui.

5. Rostrum toothed; no moveable spines, usually well-developed, sometimes reduced. Right and left periopods equal, 1st. pair stouter and usually shorter than the 2nd.; carpus of 2nd. pair

Tribe Caridea (cont.)

of periopods with 7 annulations. Family Hippolytidae.

a. Carapace with 2 supraorbital spines at each side. Third maxilliped with an exopod. Spirontocaris.

i. Rostrum with equal teeth above and below, and extending on to carapace to anterior third. S. phippsi.

ii. Rostrum with unequal teeth.

O'. Teeth of rostrum continued on carapace reaching almost to posterior margin. Rostrum short, ending in an arcuate gap between two spinous tips. S. spinus.

O". Teeth dorsally on carapace not nearly reaching posterior margin; rostrum ending in a long point. S. liljeborgi.

b. Carapace with 1 supraorbital spine on each side. Third maxilliped without an exopod. Lebbeus.

i. Abdominal segments pleura armed laterally with spines. Epipod on first 3 periopods. L. groenlandicus.

ii. Pleura of abdomen rounded, unarmed.

O'. Rostrum as long as antennular peduncle. Epipod on first 2 periopods. L. polaris.

O". Rostrum not exceeding 1st. segment of antennular peduncle. Epipod on first 3 periopods. L. microceros.

Family Hippolytidae (cont.)

c. Carapace with no supraorbital spines. Third maxilliped with an exopod. Eualus.

i. Rostrum about as long as rest of carapace.

O'. Terminal half of rostrum without spines above. Epipod on first periopod only. Eualus fabricii.

O". Terminal half of rostrum with spines above. Epipods on first 2 periopods.

A. Tubercle dorsally on 3rd. segment of abdomen, mostly with a strong hook. E. gaimardi belcheri.

B. No tubercle or hook dorsally on the 3rd. segment of abdomen. E. gaimardi gaimardi.

ii. Rostrum shorter than rest of carapace.

E. macilentus.

6. Rostrum, when present, generally small, usually dorsally flattened. First periopods subchelate. Family Crangonidae.

a. Second pair of periopods chelate.

i. Dactyls of 4th. and 5th. periopods not dilated, not natatorial. Carapace with strong sculpture. Sclerocrangon.

O'. Rostrum horizontal above, an axe-shaped expansion forming its keel. S. boreas.

O". Rostrum with tip ascending, expansion below also pointed anteriorly and obliquely downward.

S. ferox.

Family Crangonidae (concl.)

ii. Dactyls of 4th. and 5th. periopods dilated, natatorial. *Argis*.

O'. Carinae on 6th. abdominal segment each forming a tooth directed posteriorly. *A. dentata*.

O". Carinae on 6th. abdominal segment rounded posteriorly, each forming no indication of a point or tooth. *A. lar*.

b. Second pair of periopods not chelate. *Sabinea*.

i. Rostrum obtuse. *S. septemcarinata*.

ii. Rostrum acute. *S. sarsi*.

B. Body generally depressed. Abdominal appendages reduced, sometimes absent, not used for swimming. Suborder REPTANTIA

7. Carapace not fused with epistome. Abdomen anomurous, showing some traces of function other than that of reproduction; assymetrical, biramous limbs on 6th. segment. Tribe ANOMURA

a. Uropods present, modified for holding in hollow objects; abdomen soft, showing no trace of segmentation. Hermit crabs. Family Paguridae

i. Left hand with outer margin inflexed, a well-defined ridge in middle with one principal row of spines; larger face concave. *Pagurus krøyeri*.

Family Paguridae (concl.)

ii. Left hand with outer margin arcuate, not strongly ridged, a double row of spines on crest at middle, larger face convex. Pagurus pubescens.

8. Carapace fused with epistome, at least at sides. Abdomen brachyurous, small, straight, symmetrical, bent under thorax, and without biramous limbs on 6th. segment.

a. Fore part of body narrow, forming a distinct rostrum.

Family Majidae.

i. Carapace about as long as broad. Basal article of antenna long and narrow. Chionoecetes opilio.

ii. Carapace much longer than broad; rostrum elongate.

Hyas.

O'. Carapace subtriangular; basal article of antenna triangular, pointed anteriorly, smooth. Hyas araneus.

O". Carapace lyrate; basal article of antenna almost rhomboidal, narrowing anteriorly, knobbed.

Hyas coarctatus.

A. Carapace to rostrum length 4.5 - 6.4: 1.

Forma typica.

B. Carapace to rostrum length 7.1 - 9.3: 1.

Forma alutaceus.

Methods

Adults examined for this paper were taken by dredge (steel mesh in 1947, 1948 and 1949; and with rope bag in 1950, which was used in an open meshless frame and enclosed in the wire-meshed dredge in most sets), beam-trawl (a few sets only), stramin net which touched bottom, fine-meshed nets Nos. 5, 00 and 6 which touched bottom inadvertently in plankton towing, No. 00 towing in current at 40 metres (bottom depth 185 metres) and shrimp net on bottom. A considerable number of specimens were taken also from stomach contents of cod (Gadus callarias Linné), sculpin (? Myoxocephalus groenlandicus Cuvier & Valenciennes), squareflipper seal (Erignathus barbatus Erxleben), ringed seal (Phoca hispida Schreber), harbour seal (Phoca vitulina Linné), and harp seal (Phoca groenlandica Erxleben). A few specimens of Hyas sp. were taken also by hand on the shore.

Specimens, eggs, etc., were measured as preserved in about 7% formalin. Carapace lengths were measured from the posterior margin of the carapace to the posterior margin of the orbit (Chace, 1940), and total lengths from the tip of the rostrum to the tip of the telson, all with a vernier calipers: adjusting the calipers to the length of carapace under low power of a dissecting microscope in very small specimens (carapace lengths 3 to 4 mm.). Only animals in good condition were measured; many from stomach contents could not be measured. The greater diameter of an egg was measured directly at a magnification of 10X, estimated to the nearest tenth of a millimetre on a Turtox millimetre grid which had

each printed line centre scored with a sharp-pointed scalpel. Nonovigerous and ovigerous females were slit open and a few eggs removed from the ovary for measuring; largest eggs from the ovary and pleopods were used for the egg measurements recorded for each specimen.

Sex was determined from examination for appendix masculina in shrimp or prawns and spider crabs, appendages and position of sexual duct in hermit crabs and petasma in Sergestes. Sizes of appendices masculinae and eggs, or presence of eggs on pleopods, were used for a gross determination of maturity.

The number of each station referred to in the systematic account is given in the station lists of the Calanus Expeditions, 1947-1950 (Dunbar and Grainger, 1952; Grainger, 1954). Numbers of specimens and of each sex are given following the station number -- the number of specimens in parentheses when not the same as the number sexed. The definition of "arctic", "subarctic" and "boreal" follows that given by Dunbar (1953).

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Dr. M. J. Dunbar of McGill University suggested the identification of the decapods of the Calanus Expeditions collections when the present author was doing his senior undergraduate year at McGill University in 1950. At Dr. Dunbar's request, Mr. E. H. Grainger (now Dr. E. H. Grainger) carefully packaged many bottles of specimens and shipped them

to the present author at the Biological Station, St. John's, Newfoundland, in 1950-1951. Dr. Grainger also patiently answered many queries about field work and supplied various documentation for the specimens collected. In 1952, Mr. Ian McLaren sent named decapods from seal stomachs collected by the Calanus Expeditions in Ungava Bay. Miss Barbara Barry also packaged and shipped to Newfoundland a large number of specimens of decapods in 1954. Many people, whose names are not known to the present author, separated decapod larvae from material on which they were working from the Calanus Expeditions collections.

Dr. Fenner A. Chace, Jr., Curator of Marine Invertebrates, United States National Museum, in correspondence during 1950, provided an introductory bibliography to the decapods, and pointed out how sex was determined in these species. He also gave reprints of his own work on this group which were found very valuable in the preliminary work of the present author. When the present author visited the United States National Museum in 1955, Dr. Chace and his staff extended every courtesy, and made available specimens of decapods and the facilities of the Museum. All species similar to those identified from the Calanus Expeditions material, including some type species, were able to be examined as a result. Dr. Chace pointed out the wide variation in specimens of Sclerocrangon boreas from different areas, some of which were similar to those collected in Ungava Bay.

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Mr. H. Mullett made finished drawings of the graphs, and Mr. E. L. Rowe, also of the Biological Station, St. John's, photographed the drawings for the manuscript.

Work at the Biological Station, St. John's, represented by all the material on adult decapods as in this paper and most of the work on larvae in a paper to follow, was done by the present author entirely in spare time, mostly following a full day's work of other research duties at the Station. Dr. W. Templeman, Director, permitted the use of the facilities of the Station for this work.

Systematics

Occurrence of species in Ungava Bay and their world distribution as well as some variations in taxonomy of the species examined

Family SERGESTIDAE

1. Sergestes arcticus Krøyer, 1885. Sund, O., 1920; p. 8, fig. 5.
Hansen, H. J., 1908; p. 82.

In all, 267 specimens were taken. Of these, 88 were taken by shrimp net and the rest from stomach contents, as follows: cod, 174; harp seal, 4; and ringed seal, 1. Seventy-one males and 80 females examined and measured were all adult and ranged in length from 9-16 mm. carapace length. Depths where cod were taken were 15-37 metres, and the shrimp net fished at 27-37 metres. No larvae of Sergestes were taken

Sergestes arcticus (concl.)

in plankton net tows.

Occurrence at stations (Appendix, Tables VI-IX):

1947: 44 — 1M, 1F; 45 — (24) 3M, 17F;

1948: Tunnusaksuk Fjord — (1); 74, 77 & 78 — (2) 1F; between Bush and Killinek Islands — (4);

1949: 105 — 13M, 13F;

1950: Resolution Island, AS28 — (110) 47M, 38F; AS28 — (88) 17M, 23F; AS28 — (10) 3M, 4F.

World distribution. Bathypelagic in subarctic and boreal waters in the Atlantic only. East and West Greenland to Nova Scotia and mid-Atlantic; coast of Norway, 65°20'N., and south to the western part of the Mediterranean; a few were taken to the south of Australia by the Challenger (Heegard, 1941, p. 61, map Fig. 27). The Calanus Expeditions extend the range of this species westward to Hudson Strait (Resolution Island) and Port Burwell and Tunnusaksuk Fjord in Ungava Bay, and in shallower water than reported heretofore.

Family PASIPHAEIDAE

2. Pasiphaea tarda Krøyer, 1854. Sund, O., 1912, p. 14, Fig. 8.

The only way of collecting this species by the Calanus Expeditions was from stomach contents of Atlantic cod (Gadus callarias L.), and 46 specimens in all were collected. Six males and 17 females examined were adult, ranging in carapace lengths from 18-44 mm. No larvae

Pasiphaea tarda (concl.)

of this species were taken. Cod were taken in depths of 15-79 metres.

Occurrence at stations (Appendix, Tables VI, VIII, IX):

1947: 44 -- (1);

1949: 105 -- (36) 3M, 14F;

1950: AS28 -- 3M, 3F.

World distribution. A north Atlantic bathypelagic species in subarctic and boreal areas, never in the Arctic; northern Europe to Ireland; Iceland; southeast and west coasts of Greenland, and Davis Strait (J. G. De Man, 1920). Heegard (1941) gives as a record of distribution the east coast of North America at Massachusetts, but this must be from Smith (1879) who considered P. multidentata to be synonymous with P. tarda. P. multidentata, however, is described as a distinct species by most authors; it has been taken frequently off Newfoundland but P. tarda has not up to the present (Squires, unpublished). The Calanus Expeditions extend the distribution of P. tarda to the northeast coast of America at Resolution Island and Port Burwell, and in shallower water than reported heretofore.

Family PANDALIDAE

3. Pandalus montagui Leach, 1814. Rathbun, M. J., 1929, p. 8, Fig. 5.

Eighty-one specimens were taken throughout the area: 3 by stramin net which touched bottom, 11 by dredge and beam-trawl; and 37 from cod, 29 from ringed seal and 1 from squareflipper seal stomach contents.

Pandalus montagui (concl.)

In good condition when examined were 23 males, 10-18 mm., and 17 females 20-25 mm. in carapace length. Depths, 15-275 metres. Temperatures, -1.39 to -0.46°C. Salinities, 31.87 to 33.53 °/oo .

Occurrence at stations (Appendix, Tables VI, VII, IX):

1947: 18 — 1M, 1F; 45 — (17) 4M, 10F;

1948: Burwell Hr. — (4); 103 — 3M, 2F; 105 — (17) 7M, 7F; 107 — 2M;

1950: Cape Hopes Advance — (26) 1M; 208 — 1M; 224 — (1); 224 — (2) 1F.

World distribution. Subarctic and boreal (Stephensen, 1935); part of the endemic archibenthal fauna of the North Atlantic (Ekman, 1953). White Sea, Murman Sea; from the extreme north of Norway to the English Channel: the whole of the North Sea, Skagerrak, Kattegat and most western part of the Baltic, Rockall; around the coasts of Iceland; Baffin Bay; east coast of North America as far south as Latitude 41°25'N. Depths, 15-290 metres (De Man, 1920).

Taxonomy. Spines on the rostrum $\frac{6 - 17}{4 - 6}$, 2 - 7 of which are on the carapace in these specimens; $\frac{12 - 16}{6 - 9}$, 3 - 4 of which are on the carapace has been given for other areas (Rathbun, 1929). Four to 6 pairs of spines laterally on the telson, sometimes not paired (Appendix, Table XXXVIII).

Family HIPPOLYTIDAE

4. Spirontocaris liljeborgi (Danielssen, 1859). Rathbun, 1929, p.14, Fig. 13; Holthuis, 1947, p. 8.

Spirontocaris liljeborgi (concl.)

Only 2 specimens of this species were taken — in the stomach contents of squareflipper seals. One male was adult at 7 mm. carapace length.

Occurrence at stations (Appendix, Tables VII, VIII):
1948: 15 miles ENE of the Gyrfalcon Islands — 1M;
1949: 25 miles off Payne Bay — (1).

World distribution. Subarctic and boreal; Europe, from the Murman Sea south to the Kattegat; in Davis Strait, and North America from Nova Scotia to 37° north (Heegard, 1941); north coast of Alaska (Rathbun, 1910). The Calanus Expeditions collections extend the range of this species to Ungava Bay.

Hansen (1908, p. 60) states that this species is boreal and not arctic, but refers to Rathbun's record on the north coast of Alaska at 19 fath. (Rathbun, 1910, p. 68). Stephensen (1935, p. 83) calls this species boreal and accidental in low-arctic waters. Heegard (1941) also ignores the Alaska record, calling it boreal. Ekman (1953, p. 153) gives this species as an example of boreal submergence.

5. Spirontocaris phippsi (Krøyer, 1841). Holthuis, 1947, p. 8.
Rathbun, 1929, p. 13, Fig. 12.

S. turgida. Hansen, 1908; Heegard, 1941; Ekman, 1953.

In all, 137 specimens were taken: 21 by stramin net which touched bottom, 24 by dredge, and 18 in cod, 32 in ringed seal, 36 in

Spirontocaris phippsi (concl.)

squareflipper seal and 6 in harbour seal stomach contents. Depths where dredged were 14-110 metres. Temperatures -1.39 to 2.07°C. Salinities 29.40 to 33.42 ‰ .

Occurrence at stations (Appendix, Tables VI-IX):

1947: 13 -- (11) 1M, 6F; 18 -- (10) 3M, 6F; 33 -- 2M, 2F; 45 -- 3F; 45 -- (6) 1M, 4F; 48 -- 1F;

1948: Koksoak River mouth -- (34) 1M, 32F; 15 miles ENE Gyrfalcon Islands -- (2) 1F; 58 -- 2F; 59 -- 4F; off Whale River -- (28) 11F;

1949: 105 -- (9) 1M, 7F; Button Islands -- (6) 1F; 126 -- 2F;

1950: Cape Hopes Advance -- (1); 202 -- (3) 2F; 208 -- 1M; 210 -- 5F; 222 -- 3F; 224 -- 2F.

World distribution. Circumpolar, in subarctic waters; southward to northern Norway; Cape Cod, east coast of North America; Plover Bay, Siberian east coast. Depths 11-225 metres (Holthuis, 1947).

Taxonomy. Spines on rostrum $\frac{4 - 18}{3 - 8}$, 0-6 of which are on the carapace (somewhat less in males than females) in these specimens; for other areas $\frac{7 - 12}{4 - 7}$, 4-5 of which are on the carapace has been given (Rathbun, 1929). Two to 7 pairs of spines laterally on the telson, often not paired completely (Appendix, Table XXXIX).

6. Spirontocaris spinus (Sowerby, 1805). Holthuis, 1947, p. 8.

S. spina. Rathbun, 1929, p. 14, Fig. 14.

In all, 185 specimens were taken: 77 by dredge and beam-trawl,

Spirontocaris spinus (cont.)

34 by stramin net which touched bottom, and in stomach contents, 47 in cod, 21 in squareflipper, 3 in ringed and 3 in harbour seals. Depths where dredged were 9-275 metres. Temperatures -1.39 to 3.10°C. Salinities 29.40 to 33.42 °/oo .

Occurrence at stations (Appendix, Tables VI-IX):

1947: 3 -- 1F; 11 -- 1F; 13 -- 3M, 5F; 18 -- (8) 2M, 4F; 33 -- 4M, 3F; 44 -- (2); 45 -- (9) 4M, 4F; 48 -- 1M, 1F;

1948: Off Koksoak River -- (1); 15 miles ENE Gyrfalcon Islands -- (3) 2F; 59 -- 2F;

1949: 103 -- 3M, 16F; 106 -- 1F; 107 -- 2M, 2F; Port Burwell -- (1); 105 -- (1); 105 -- (22) 4M, 9F; Button Islands -- (3); off Payne Bay -- (1); 126 -- (1); 128 -- 11M, 7F;

1950: Cape Hopes Advance -- (5); 201C -- 1F; 202 -- (12) 2M; 203 -- 2F; 208 -- 2M, 5F; 210 -- 2M, 3F; 222 -- 9M, 15F; 224 -- 2F; 226 -- 1M, 1F; 224 -- (10) 2M, 5F.

World distribution. Circumpolar, subarctic and boreal; southward to the northern North Sea; Iceland; Greenland; North America, Massachusetts Bay to the Behring Sea, Alaska Peninsula; Siberian east coast. Depths 16-400 metres (Heegard, 1941; Holthuis, 1947). This species is also denoted as a constituent of the archibenthal fauna (Ekman, 1953).

Taxonomy. Major spines on rostrum $\frac{8 - 28}{1 - 5}$, 4-21 of which are on the carapace in these specimens; given for other areas $\frac{9 - 33}{2 - 5}$, with

Spirontocaris spinus (concl.)

an average of 18-19 above (Rathbun, 1929). The spines counted above on the rostrum and carapace are major ones only; there are very many secondary serrulate spines in addition. Four to 10 spines laterally on the telson, often not always paired (Appendix, Table XL).

7. Lebbeus groenlandicus (J. C. Fabricius, 1775). Holthuis, 1947, p. 9.
Spirontocaris groenlandica. Rathbun, 1929, p. 11, Fig. 8.

In all, 413 specimens were taken: 159 by dredge and beam-trawl, 7 by stramin net which touched bottom, 2 by shrimp net on bottom, and 40 in cod, 176 in squareflipper seal, 14 in ringed seal and 14 in harbour seal stomach contents. Depths where dredged, etc., 18-275 metres. Temperatures, -1.39 to 2.16°C. Salinities, 28.99 to 33.53 $^{o}/_{oo}$.

Occurrence at stations (Appendix, Tables VI-IX):

1947: 3 — 2M, 2F; 11 — (7) 2M, 3F; 13 — 1M, 1F; 18 — (1); 20 & 21 — 3F; 28 — 6M, 8F; 30 — 20M, 13F; 33 — 2M, 6F; 45 — (11) 1M, 7F; 48 — 3M, 1F;

1948: 30 miles toward Burwell from George River — (2); Koksoak River mouth — (12) 3F; 53 — 1M; 15 miles ENE Gyrfalcon Islands — (39) 8M, 4F; 58 — 6M, 1F; 59 — 4M, 5F; off Whale River — (45) 4F;

1949: 103 — 10M, 16F; 106 — 3F; 105 — (14) 3M, 7F; Button Islands — (15) 6F; off Payne Bay — (5); 126 — 3M, 3F; 103 — 1M, 3F;

Lebbeus groenlandicus (concl.)

1950: Cape Hopes Advance -- (3); 202 -- (69) 2M, 10F; 205 -- (2); 206 -- 2M; 208 -- 1M, 2F; 210 -- 3M, 8F; 212 -- (4); 216 -- 1F; 222 -- 5M, 3F; 224 -- (13) 3M, 3F; 226 -- 4M, 6F; 236 -- (9) 1F; AS28 -- (3) 1M, 1F.

World distribution. Arctic, subarctic and boreal; Pacific (Heegard, 1941). East and West Greenland, southward to Massachusetts Bay; arctic Canada; Behring Sea to Puget Sound; Sea of Okhotsk. Depths 2-210 metres (Holthuis, 1947).

Taxonomy. Spines on rostrum $\frac{1 - 4}{1 - 4}$, plus 4 spines invariably on carapace in these specimens; $\frac{2 - 3}{2 - 3}$, plus 4 spines invariably on the carapace has been given for other areas (Rathbun, 1929). Six to 7 spines laterally on the telson in the specimens examined (Appendix, Table XLI).

8. Lebbeus polaris (Sabine, 1821). Holthuis, 1947, p. 9.

Spirontocaris polaris. Rathbun, 1929, p. 12, Fig. 9.

As in West Greenland (Stephensen, 1935) this was the most abundant species taken in Ungava Bay by the Calanus Expeditions.

In all, 473 specimens were taken: 211 by dredge and beam-trawl, 23 by stramin net which touched bottom, 2 by plankton net No. 00 at 40 metres (not on bottom), 123 by plankton net No. 5 which touched bottom, 19 by shrimp net, and 69 in cod, 13 in ringed seal, 8 in squareflipper

Lebbeus polaris (cont.)

seal and 5 in harbour seal stomach contents. Depths where taken by dredge, etc., 5-275 metres. Temperatures -1.39 to 3.40°C. Salinities 29.40 to 33.53 °/oo .

Occurrence at stations (Appendix, Tables VI-IX):

1947: 3 -- 4F; 7 -- 3M, 4F; 11 -- 3M; 18 -- (5) 4F; 20 & 21 -- 2M, 2F; 28 -- 2F; 33 -- 1M; 45 -- (37) 12M, 22F;

1948: 30 miles toward Burwell from George River -- (1); Koksoak River mouth -- (7); 15 miles ENE Gyrfalcon Islands -- (3); 58 -- 5F; 59 -- 14M, 29F; off Whale River -- (1);

1949: 103 -- 25M, 36F; 106 -- 1M, 1F; 107 -- 1M, 1F; Port Burwell -- (6) 1M; 105 -- (20) 11M, 8F; Button Islands -- (5); 123 -- (123) 3Juv, 8M, 11F; 124 -- 10Juv, 1M, 1F; 126 -- 1F; 128 -- (2); 103 -- 3M, 2F;

1950: Cape Hopes Advance -- (3); 206 -- 1F; 208 -- (15) 4M, 10F; 210 -- 6M, 11F; 216 -- 3F; 222 -- (29) 11M, 17F; 224 -- (18) 2M, 8F; 226 -- 2M, 1F; Resolution Island -- 4M, 17F.

World distribution. Arctic, subarctic and boreal; circumpolar. Southward to the Skaggerak and Hebrides, and to Cape Cod in North America; Behring and Okhotsk Seas and the Aleutian Islands. Depths 0-930 metres (Holthuis, 1947).

Taxonomy. Spines on rostrum $\frac{0-6}{0-6}$, 0-5 of which are on the carapace and with 2-10 pairs of spines on the telson, laterally, in these

Lebbeus polaris (concl.)

specimens (Appendix, Table XLII); $\frac{0 - 8}{1 - 5}$, with 7-9 pairs of spines on the telson has been given for other areas (Rathbun, 1929). In males only, the rostrum and carapace are occasionally entirely free of spines and the blade of the rostrum is reduced and thickened dorsally. This appears to be a condition present in mature animals only. It has been referred to as a variation with a reduced rostrum (Rathbun, 1929).

9. Eualus fabricii (Krøyer, 1841). Holthuis, 1947, p. 10.

Spirontocaris fabricii. Rathbun, 1929, p. 15, Fig. 15.

In all, 416 specimens were taken: 173 by dredge and beam-trawl, 44 in stramin net which touched bottom, 39 by No. 00 plankton net which touched bottom, 6 by shrimp net, and 70 in cod, 27 in squareflipper seal, 37 in ringed seal and 20 in harbour seal stomachs. Depths where taken by dredge, etc., 10-275 metres. Temperatures -1.39 to 3.40°C. Salinities 28.49 to 33.53 °/oo .

Occurrence at stations (Appendix, Tables VI-IX):

1947: 7 -- 3M, 13F; 11 -- 4M, 9F; 13 -- 1F; 18 -- 27M, 9F; 20 & 21 -- 2M, 10F; 27 -- 1M, 2F; 28 -- 1M, 3F; 33 -- 7M, 11F; 44 -- 1F; 45 -- 6M, 15F; 45 -- (28) 6M, 18F;

1948: Koksoak River mouth -- (37); 53 -- 1F; 15 miles ENE Gyrfalcon Islands -- (7) 2M; 58 -- 5M, 1F; 59 -- 15F; off Whale River -- (1);

Eualus fabricii (concl.)

1949: 102 -- (1); Burwell Harbour -- 1F; 103 -- 1Juv, 2M; 107 -- 13F; Mission Cove -- (1); Port Burwell -- (11) 3F; 105 -- 1M; Button Islands -- (20) 6M; 123 -- (14) 5Juv, 4F; off Payne Bay -- (4) 3F; 124 -- 1M, 3F; 126 -- 10F; 128 -- 17M, 8F; 103 -- 3F;

1950: 203 -- 5M, 2F; 206 -- 2F; 208 -- (10) 4M, 5F; 210 -- 1M, 11F; 222 -- 1F; 224 -- 1M, 2F; 226 -- 5F; 224 -- (2) 1F; 236 -- (1); Resolution Island -- 3M, 4F.

World distribution. Arctic, subarctic and boreal. A Pacific species extending to West Greenland (Stephensen, 1935); from the Siberian east coast and Japanese Sea through arctic Alaska and arctic Canada to West Greenland and southward to Massachusetts Bay on the east coast of the United States. Depths 4-200 metres (Holthuis, 1947).

Taxonomy. Spines on rostrum and carapace $\frac{1 - 5}{1 - 5}$, of which 0-1 are on the rostrum (mostly 0), and 2-6 pairs of spines laterally on the telson in specimens examined (Appendix, Table XLIII); $\frac{2 - 6}{1 - 5}$, 0-2 on the rostrum, 4 pairs of spines laterally on the telson has been given for other areas (Rathbun, 1929).

10. Eualus gaimardi (H. Milne-Edwards, 1837). Holthuis, 1947, p. 10.
Spirontocaris gaimardi. Rathbun, 1929, p. 16, Fig. 16.

In all, 102 specimens were taken: 34 in dredge and beam-trawl,

Eualus gaimardi (cont.)

1 in stramin net which touched bottom, 4 in No. 6 plankton net which touched bottom, 3 in No. 0 plankton net which touched bottom, 1 in shrimp net, and 33 in cod, 3 in squareflipper seal and 23 in ringed seal stomach contents. Depths 15-275 metres. Temperatures -1.39 to 3.10°C. Salinities 28.49 to 33.53 °/oo .

Occurrence at stations(Appendix, Tables VI-IX):

1947: 11 -- 1F; 18 -- 1F; 20 & 21 -- 1F; 33 -- 4Juv, 3F; 45 -- 3M, 9F; 45 -- (20) 7M, 11F;

1948: 15 miles ENE Gyrfalcon Islands -- (1); 59 -- 2F;

1949: Burwell Harbour -- (2); 103 -- 2F; Port Burwell -- (20) 2F; 105 -- (10) 2M, 7F;

1950: Cape Hopes Advance -- (2); 201C -- 1M; 202 -- (1); 224 -- 1M, 1F; 234 -- (3) 1M, 1F; Resolution Island -- (2) 1F.

World distribution. Arctic, subarctic and boreal; a boreo-arctic or pan-arctic species, circumpolar (Heegard, 1941). Southward to the North Sea, Yarmouth and Kiel; east coast of North America to Cape Cod; west coast of North America to Sitka; and Siberia. Depths 10-900 metres (Holthuis, 1947).

Taxonomy. Spines on rostrum $\frac{6 - 11}{2 - 5}$, 2-3 on the carapace, and 2-6 pairs of spines laterally on the telson in these specimens (Appendix, Table XLIV); $\frac{5 - 10}{2 - 7}$, 3-5 on carapace has been given for other areas (Rathbun, 1929). These specimens were entirely without a lobe or hook on the

Eualus gaimardi (concl.)

third abdominal segment, dorsally, similar in males and females. This is thought by some to be characteristic of more southerly areas (Holthuis, 1947). However, there was a blunt lobe or tubercle on a few others which might be considered as intermediate between the typical species and its form, E. gaimardi belcheri; these were included in the following group assigned to E. gaimardi belcheri which had a strong hook on the lobe. In view of the occurrence together of the typical species and its form, the extremes may not be said to follow a geographical incidence or cline in these areas. Also, as far southerly as St. Mary's Bay, Newfoundland, a considerable number has been taken with a well-developed hook and lobe in all males and females (Squires, unpublished).

11. Eualus gaimardi belcheri (Bell, 1855). Holthuis, 1947, p. 10.
Spirontocaris gaimardi belcheri. Rathbun, 1929, p. 16, Fig. 17.

In all, 46 specimens were taken: 23 in dredge and beam-trawl, 6 in stramin net which touched bottom, and 7 in cod, 6 in squareflipper seal, 3 in ringed seal and 1 in harbour seal stomach contents. Depths where dredged, etc., 15-275 metres. Temperatures -0.46°C. Salinities 33.53 °/oo .

Occurrence at stations (Appendix, Tables VI-IX):

1947: 33 -- 1F; 45 -- 7M, 4F;

1948: 15 miles ENE Gyrfalcon Islands -- (1); Keglo Bay -- (1);

1949: 102 -- 2F; 103 -- 6M, 15F; 105 -- 1F; 103 -- 4M, 2F;

1950: Cape Hopes Advance -- (7); 227 -- (1).

Eualus gaimardi belcheri (concl.)

World distribution. Arctic, subarctic and boreal; circumpolar. Southward to the North Sea, and on the east coast of North America to Cape Cod, also on the west coast at Sitka. Siberia. The distribution of this form follows closely that of the typical E. gaimardi (Heegard, 1941).

Taxonomy. Spines on rostrum $\frac{5 - 8}{3 - 5}$, 3-4 on carapace, and 4-6 pairs of spines laterally on the telson in these specimens (Appendix, Table XLV); $\frac{8 - 12}{3 - 5}$, 2-4 on the carapace has been given for other areas (Rathbun, 1929). All these specimens had a lobe or tubercle -- mostly produced as a hook -- on the 3rd. abdominal segment in males and females.

12. Eualus macilentus (Krøyer, 1841). Holthuis, 1947, p. 11.

Spirontocaris macilenta. Rathbun, 1929, p. 16, Fig. 18.

Only 4 specimens were taken: 1 by dredge and 3 in stomach contents of ringed seal. Depths of dredging 55-73 metres.

Occurrence at stations (Appendix, Tables VIII, IX):

1949: Burwell Harbour -- 1F; 107 -- 1F; Port Burwell -- (1);

1950: Cape Hopes Advance -- (1).

World distribution. Arctic and subarctic. A Pacific species to West Greenland (Stephensen, 1935), south to Nova Scotia. Alaska, Okhotsk Sea, Behring Sea and Strait to the Siberian Polar Sea. Depths 150-540 metres (Holthuis, 1947).

Eualus macilentus (concl.)

Taxonomy. Spines on rostrum $\frac{14 - 16}{2 - 3}$, 1-3 on the carapace and 3 pairs of spines laterally on the telson in 2 females examined; $\frac{9 - 16}{1 - 4}$, 0-3 spines on the carapace and with 3 pairs of spines laterally on the telson has been given for other areas (Rathbun, 1929).

Family CRANGONIDAE

13. Argis dentata Rathbun, 1902. Rathbun, 1929, p. 21, Fig. 27.
Nectocrangon lar Owen, 1839 (in part). Stephensen, 1935, p. 13.
Not N. lar (Owen). Rathbun, 1910, p. 137, Fig. 74.

Specimens taken number 340; 67 by dredge and beam-trawl, and 7 in cod, 253 in squareflipper seal, 6 in ringed seal and 7 in harbour seal stomach contents. Depths where taken by dredge and beam-trawl were 18-130 metres. Temperatures where observed were -1.22 to 2.07°C. Salinities, 29.40 to 33.42 °/oo .

Occurrence at stations (Appendix, Tables VI-IX):

1947: 11 — 1M, 2F; 20 & 21 — 3M, 1F; 33 — 1M, 1F; 45 — 3F; 45 — (6) 5F;

1948: 30 miles toward Burwell from George River — (21); Koksoak River mouth — (50) 4F; 15 miles ENE Gyrfalcon Islands — (63) 7M, 10F; off Leaf Bay — (3); 74, 77 & 78 — 1M; off Whale River — (9) 1F;

Argis dentata (cont.)

1949: 102 -- 2M, 22F; 107 -- 1M, 2F; 105 -- (3) 2F; Button Islands -- (7); off Payne Bay -- (1); 126 -- 1M, 5F;

1950: Cape Hopes Advance -- (32) 5M, 1F; 201C -- 1M; 202 -- (44) 4M, 8F; 203 -- 5Juv, 4M, 11F; 212 -- (2); 222 -- 1M; 236 -- (31) 4M, 4F.

World distribution. Arctic, subarctic and boreal; a Pacific species (Heegard, 1941). Behring Sea southward to southeast coast of Kamchatka and Plover Bay, Siberia, and Aleutian Islands and the Alaska Peninsula to Sitka; (Canadian arctic) and the Atlantic coast of North America from Greenland to Nova Scotia (De Man, 1920). Depths 11-176 metres (Rathbun, 1910).

Taxonomy. The rostrum is reduced and there is always a line of 3 spines dorsally on the carapace. Dr. M. J. Rathbun's named specimens of Argis dentata and A. lar, including type specimens of A. dentata, at the United States National Museum show that these two species are quite distinct. The dorsal carinae of the 6th. abdominal segment of specimens of A. lar are rounded posteriorly, but in A. dentata these carinae are pointed posteriorly to form a tooth in many and in some merely pointed but not rounded. The condition of pointedness was present in all specimens collected by the Calanus Expeditions in Ungava Bay, 1947-1950 (Table I). It is not known whether the European authors (Stephensen, 1935; Hansen, 1908; Heegard, 1941), who consider A. dentata and A. lar to be synonymous, examined specimens of A. lar from the Pacific. Dr. Rathbun ex-

Argis dentata (concl.)

amined specimens from Greenland collected by the Princeton Expedition and called them A. dentata (Rathbun, 1910, p. 139). It is presumed, therefore, that A.lar is confined in its distribution to the Pacific, and has not been taken farther east than Point Barrow, Alaska (MacGinitie, 1955).

Table I. Condition of posterior end of dorsal carinae on the 6th. abdominal segment in specimens of Argis dentata collected in Ungava Bay by the Calanus Expeditions, 1947-1950.

Males		Females	
Sharp-pointed forming a tooth	Medium-pointed not forming a tooth	Sharp-pointed forming a tooth	Medium-pointed not forming a tooth
14	5	22	27

14. Sclerocrangon boreas (Phipps, 1774). Rathbun, 1929, p. 20, Fig. 25.

Specimens taken number 227; 9 by dredge, and 1 in cod, 174 in squareflipper seal, 39 in ringed seal and 4 in harbour seal stomach contents. Depths where taken by dredge, 18-91 metres. Temperatures, 1.90 to 2.07°C. Salinities, 29.40 to 31.87 °/oo .

Occurrence at stations (Appendix, Tables VI-IX):

1947: 30 -- 1M; 33 -- 2M, 1F; Button Islands -- (1);

Sclerocrangon boreas (cont.)

1948: Koksoak River mouth -- (45) 5M, 9F; 15 miles ENE Gyrfalcon Islands -- (3) 1F; off Whale River -- (38) 3F;

1949: 105 -- 1F; Button Islands -- (4) 2F; off Payne Bay -- 1F; 126 -- 1F;

1950: Cape Hopes Advance -- (8) 1F; 202 -- (32) 8M, 5F; 203 -- 1M, 2F; 205 -- (1); 222 -- 1F; 236 -- (83) 20F.

World distribution. Arctic, subarctic and boreal. Widely distributed in the arctic but not known to be circumpolar; it is found also in boreal areas (Heegard, 1941). Arctic Siberia near Behring Strait and arctic Alaska (most abundant species of shrimp taken at Point Barrow; MacGinitie, 1955); southward via Behring Sea to Kilesnov, and the Straits of Georgia, British Columbia; in the Atlantic from Cape Cod northward to the Canadian Arctic from Baffin Land to Melville Island; West and East Greenland, Iceland, the Norwegian coast north of the Arctic Circle, Spitzbergen, Bear Island and Novaja Zelmya. Depths 0-400 metres (Heegard, 1941).

Taxonomy. All specimens had constant characters which differed fairly considerably from those given for the species by Rathbun (1929), and from specimens like the typical ones described by Rathbun, taken in shallow water in Newfoundland (H. J. Squires, unpublished). However, Albatross specimens taken off Newfoundland correspond with the Ungava Bay specimens (Fenner A. Chace, Jr., personal communication) and inter-

Sclerocrangon boreas (concl.)

gradations exist in the species material in the United States National Museum which would suggest that these forms are not separate species. A table of comparison (Table II) and a figure (Fig. 1) show the main differences.

Table II. Comparative characters in a typical specimen of Sclerocrangon boreas from Ungava Bay, collected by the Calanus Expeditions, 1947-1950, and a specimen from Change Islands, Newfoundland, collected in 1948, typical of those described by Rathbun, 1929.

Female, 26 mm. carapace length, typical of Ungava Bay specimens	Female, 25 mm. carapace length, from Change Islands, Nfld.
Carapacial spines, 3, centre one double, high	Carapacial spines, 3, centre one single, low
Branchiostegal spines wide-spreading to outside outline of carapace width; long, exceeding rostrum and outer spine on peduncle of antenna	B. spines not wide-spreading, included in outline of carapace width; hardly exceeding rostrum and about equal anteriorly to outer spine on peduncle of antenna
Pterygostomian spine further anteriorly than antennal spine	Pterygostomian spine about even with antennal spine
Hepatic spines not included in outline of carapace width	Hepatic spines included in outline of carapace width
Tubercle on 1st. abdominal segment dorsally projecting anteriorly higher than carapace edge	Tubercle dorsally on 1st. abdominal segment not produced higher than carapace edge
Pleron of 2nd. abdominal segment has a tooth directed posteriorly	No tooth on pleron of 2nd. abdominal segment directed posteriorly
Variable number of teeth on pleura of abdominal segments in some	Not more than one tooth on each pleuron of abdominal segments

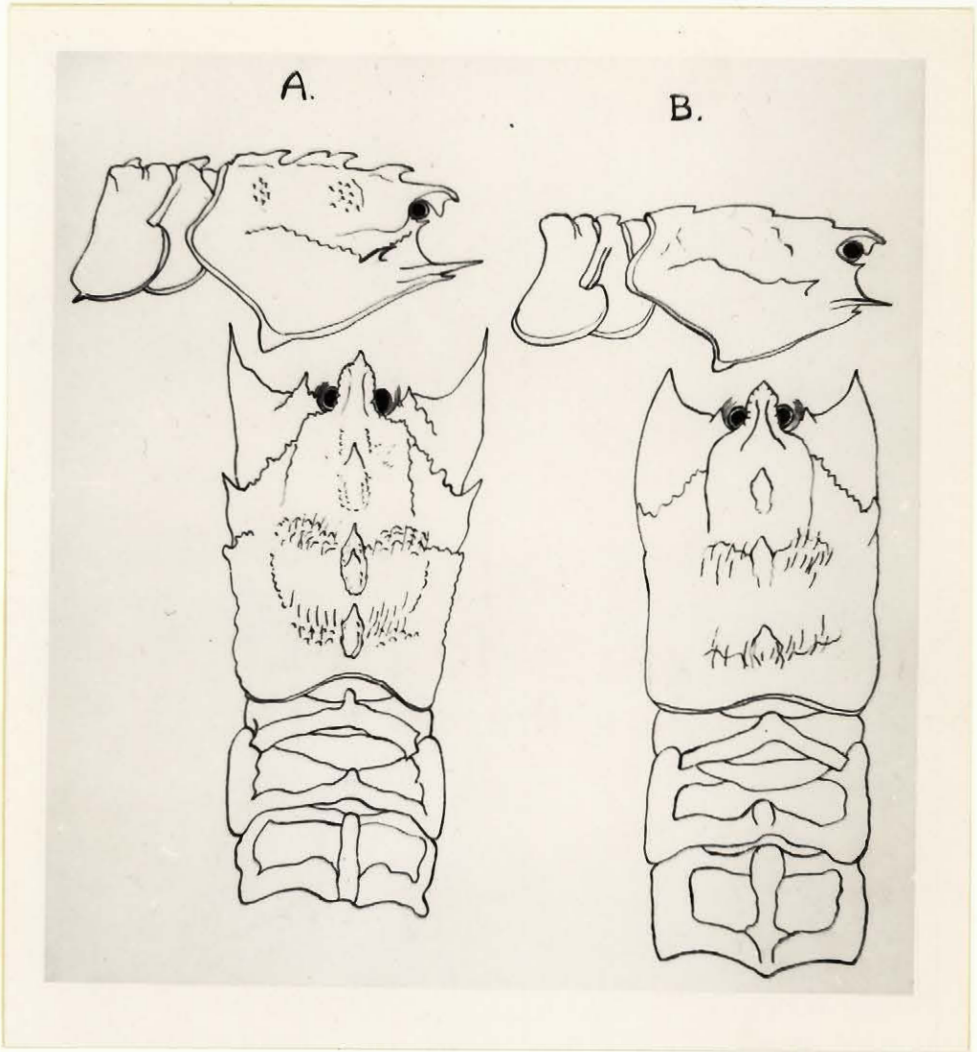

Figure 1. Diagram of female, 26 mm. carapace length, typical of Ungava Bay specimens — A; and of female, 25 mm. carapace length, Change Islands, Newfoundland — B.

15. Sabinea septemcarinata (Sabine, 1824). Rathbun, 1929, p. 22, Fig. 28.

Only 12 specimens were taken: 4 by dredge and beam-trawl, and 7 in cod and 1 in squareflipper seal stomach contents. Depths where dredged and trawled 18-130 metres. Temperatures, -1.22 to 3.10°C. Salinities, 28.78 to 33.42 °/oo .

Occurrence at stations (Appendix, Tables VI, VIII, IX):

1947: 33 — 1F; 45 — (3) 1M, 1F;

1949: 102 — 1F; 105 — (4) 1F;

1950: 201C — 1F; 202 — 1F; 222 — 1F.

World distribution. Arctic and subarctic; an arctic circumpolar species (Stephensen, 1935). Siberian Polar Sea to the Kara Sea, Spitzbergen and Barents Sea, White Sea, Murman Sea, west coast of Norway to Lofotes and further south; Iceland; East and West Greenland as far north as Discovery Bay and Grinnell Land; north of Canada, 115-141°W. Longitude; south to Massachusetts Bay, east coast of North America. Not known from the Pacific. Depths, 0-245 metres (De Man, 1920; Stephensen, 1935). Taken off Point Barrow, Alaska (MacGinitie, 1955). The Calanus Expeditions collections establish its occurrence in Ungava Bay for the first time.

Family PAGURIDAE

16. Pagurus krøyeri Stimpson, 1857. Rathbun, 1929, p. 27, Fig. 36.

Eupagurus krøyeri. Smith, 1879, p. 48. Hansen, 1908, p. 28.

Pagurus krøyeri (concl.)

Seventy specimens were taken: 60 by dredge and beam-trawl, 1 in stramin net which touched bottom and 9 in stomach contents of cod. Depths 15-275 metres. Temperatures -1.18 to 3.10°C. Salinities 29.76 to 33.53 °/oo .

Occurrence at stations (Appendix, Tables VI-IX):

1947: 11 -- 1M, 2F; 28 -- 2F; 33 -- (17) 8M, 8F; 45 -- 1M, 2F; 45 -- (2) 1F;

1948: 59 -- 2M; 74, 77 & 78 -- 1M;

1949: 103 -- 2M, 1F; 106 -- 1Juv, 1M, 4F; 107 -- 3F; 105 -- (6); 126 -- (2) 1M; 103 -- 1F;

1950: 201C -- 7M, 7F; 203 -- 1M; 226 -- 2M, 1F; 231 -- 1F.

World distribution. Arctic, subarctic and boreal. An Atlantic species, low-arctic, boreal, more arctic than P. pubescens (Smith, 1879). Greenland to Stellwagen's Bank, east coast of North America, in deeper water to the south; northern Canada; northern Europe. Depths 5-500 metres (Smith, 1879; Rathbun, 1929).

Taxonomy. All specimens taken were invariably similar to the type. Hansen (1908) believed this species to be synonymous with P. pubescens because he stated to have found intergrading specimens. However, both species are distinct without intergrading forms in specimens at the U. S. National Museum. Also, both species occur without intergradations as far as observed in the Newfoundland area (H. J. Squires, unpublished).

Family MAJIDAE

17. Hyas coarctatus Leach, 1815. Rathbun, 1929, p. 37, Fig. 51.

Seventy-eight specimens were taken: 37 by dredge and beam-trawl, and 10 in cod, 1 in ringed seal, 20 in squareflipper seal, 4 in harbour seal and 3 in sculpin stomach contents, and 3 by hand on the shore. Depths 0-130 metres. Temperatures -1.39 to -1.22°C. Salinity 33.42 °/oo .

Occurrence at stations (Appendix, Tables VI-IX):

1947: 20 & 21 — (1); 28 — 1M; 45 — 1M, 1F; 45 — 3F;

1948: Leaf Bay — 1M; 74, 77 & 78 — 1M; 70 — 1M; Port Burwell — 3F;

1949: 102 — 1M; 107 — 1F; 105 — 2M, 1F; Button Islands — (4); off Payne Bay — (4); 126 — 7M, 11F;

1950: Cape Hopes Advance — (2); 202 — (7); 204 — (1); 206 — 1M; 208 — 2M, 1F; 210 — 2M, 2F; 212 — (3); 215 — (1); 216 — (2) 1F; 224 — 1F; 226 — 2F; 224 — (2) 1F.

World distribution. Arctic, subarctic and boreal. The typical form is boreo-lower arctic (Heegard, 1941). Atlantic: West Greenland, Hudson Bay, east coast of North America to North Carolina; Iceland to $66\frac{1}{2}^{o}$ north; northern Europe, $79\frac{1}{2}^{o}$ north, southward to the English Channel. Arctic: Mackenzie River, Alaska, Siberian coast to Bennett Island. Pacific: Behring Sea to west coast of Alaska and to Korea (Heegard, 1941). H. coarctatus alutaceus has been recorded from the Pacific, arctic and west Atlantic (Rathbun, 1929), but this form was not present in the

Hyas coarctatus (concl.)

Calanus Expeditions collections.

Taxonomy. The ratio of carapace length to rostrum length has been used to separate the typical H. coarctatus from the form H. coarctatus alutaceus. In H. coarctatus alutaceus the carapace length is 7.1 to 9.3 times as long as the rostrum length, while this ratio is 4.5 to 6.4 times in the typical H. coarctatus, carapace lengths 30 to 52 mm. (Rathbun, 1929). The latter ratios are similar to those found for specimens collected in the Ungava Bay area (Table III).

Lengths and maturities of species

Lengths. Each specimen was measured when possible in order to give sizes of the animals which would allow comparisons with those of specimens from other areas (A basis of comparison is the length of each species when first mature (Chace, 1940)). A regional comparison is not attempted in this paper. Since whole lengths, however, are given by many authors, while carapace lengths are used in this paper, regression equations are given for conversion of carapace lengths to whole lengths. These equations were calculated from sight curves drawn to points plotted from average whole lengths at each carapace length (Fig. 2-4; Appendix, Tables XI-XXV). The curves in Figures 2-4 were weighted according to the number of measurements supporting each average; meas-

Table III. Ratio of carapace length to rostrum length in Hyas coarctatus collected in Ungava Bay by the Calanus Expeditions, 1947-1950.

Average carapace length	Carapace times rostrum	Number of specimens examined
mm.		
7	2.3	2
12	4.0	1
17	3.4	2
22	4.4	1
27	4.5	8
32	4.6	4
37	5.3	6
42	5.3	7
47	6.0	3
52	6.5	1
57	...	...
62	6.2	1
67	...	...
72	...	...
77	...	...
82	...	...
87	7.3	1

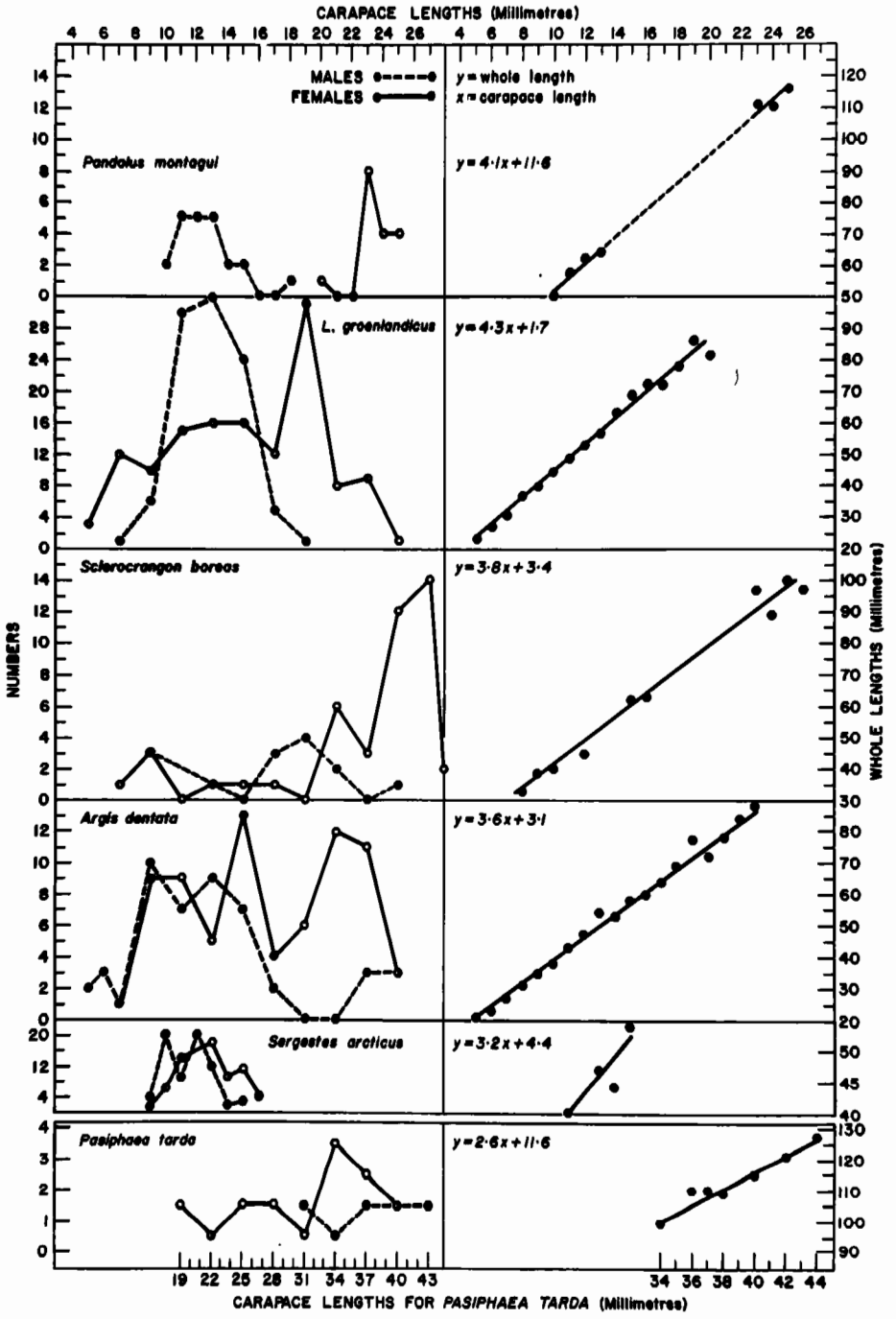

Figure 2. Carapace lengths of male and female P. montagui, L. groenlandicus, S. boreas, A. dentata, S. arcticus and P. tarda; with regressions curves and equations for conversion of carapace lengths to whole lengths in each species.

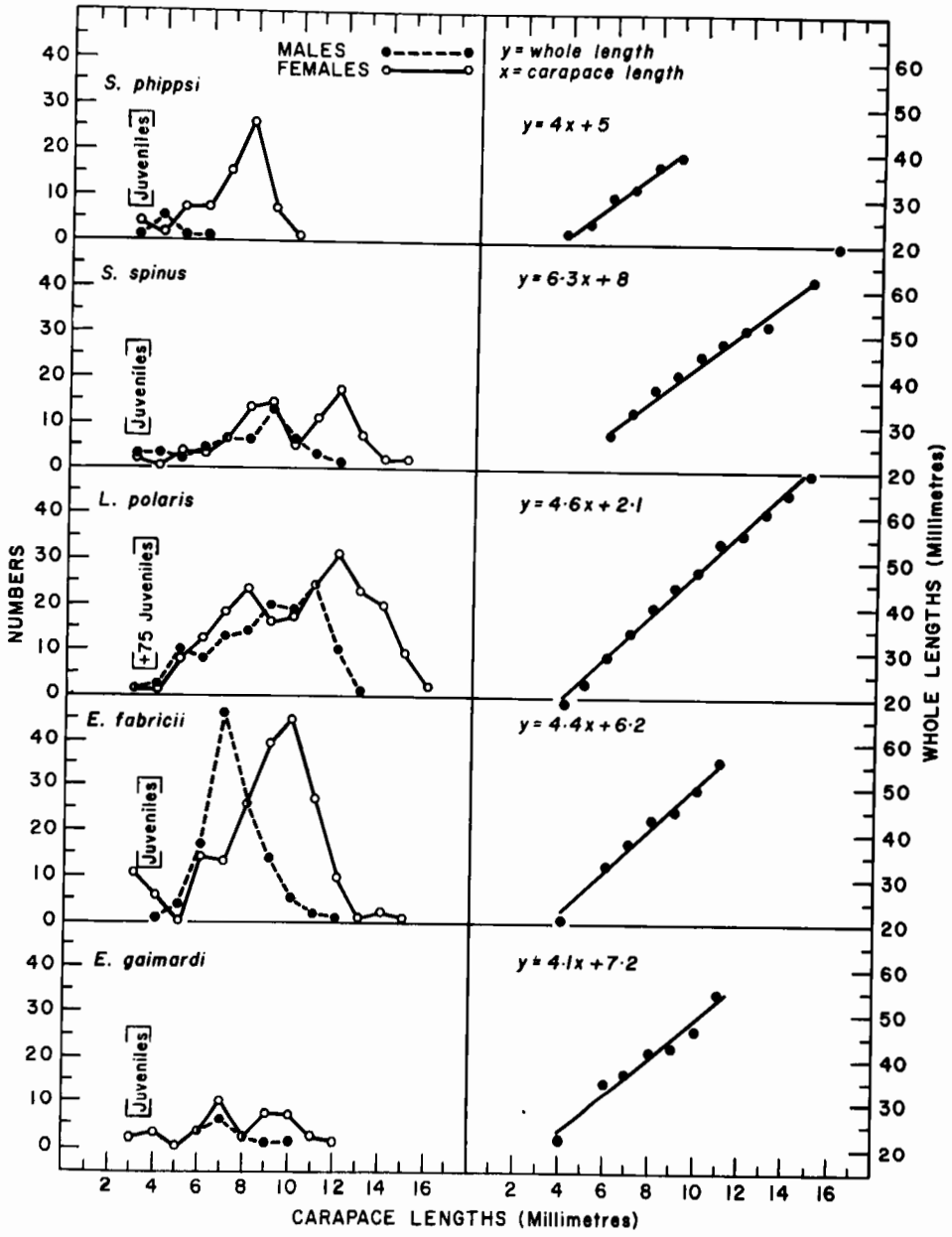

Figure 3. Carapace lengths of male and female S. phippsi, S. spinus, L. polaris, E. fabricii and E. gaimardi; with regression curves and equations for conversion of carapace lengths to whole lengths in each species.

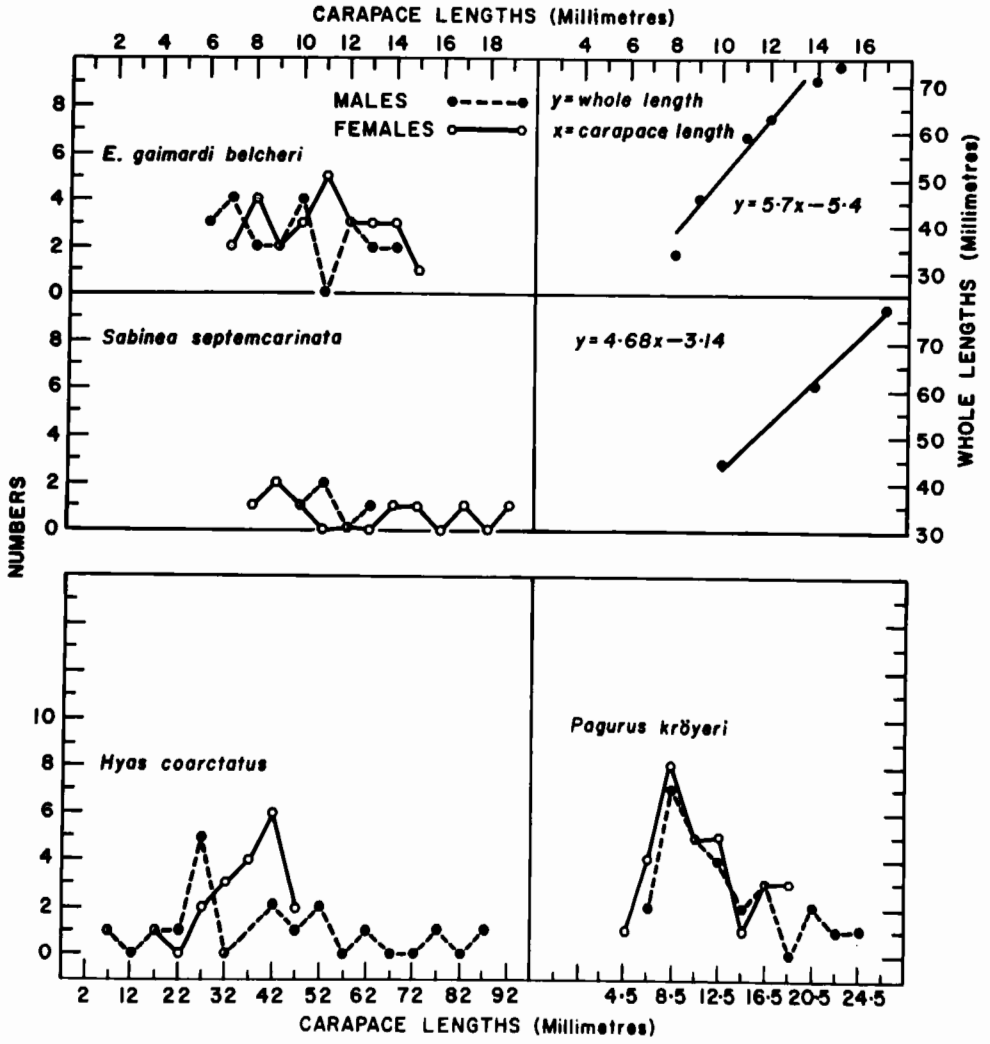

Figure 4. Carapace lengths of male and female E. gaimardi belcheri, S. septemcarinata, H. coarctatus and P. krøyeri; with regression curves and equations for conversion of carapace lengths to whole lengths in E. g. belcheri and S. septemcarinata.

urements of males and females were combined for these curves.

It is striking that in the shrimp species collected, all, with the possible exception of Pasiphaea tarda, had females which exceeded the males in length (Fig. 2-4). This was particularly evident in species taken in larger quantities such as Lebbeus polaris and Eualus fabricii (Fig. 3), and Lebbeus groenlandicus (Fig. 2). It was less evident in E. gaimardi belcheri (Fig. 4). In hermit crabs (Pagurus krøyeri) and spider crabs (Hyas coarctatus) the males generally exceeded the females in length (Fig. 4), although average lengths were not greatly different. The array of lengths in female shrimp shows considerably greater scatter than in males and possibly greater growth in females (Appendix, Tables XI-XXIII). The generally smaller size of males compared with females in shrimp seems to show a similarity with many marine animals of which fishes are notable examples (Templeman and Squires, in press). This follows from the fact that males mature at a somewhat smaller size (Table IV), and possibly earlier in age than females, and growth is slower as a consequence thereafter.

The shrimp, Pandalus montagui, presents a special case where the animals are protandrous (Thorson, 1946, p. 325). No males taken exceeded 18 mm. in carapace length, and females taken were not less than 20 mm. in carapace length and reached an extreme length of 25 mm. in these specimens (Fig. 2).

The largest specimens of shrimp taken belonged to the species

Table IV. Carapace lengths and average egg diameters and indication of first maturity in males and females of shrimp collected by the Calanus Expeditions in Ungava Bay, 1947-1950 (Egg diameter underlined at length which females were observed to be first mature, and an asterisk at length which males were observed to be first mature).

Species	Carapace lengths — mm.										
	4	5	6	7	8	9	10	11	12	13	14
P. montagui	...	...	...	...	...	...	...	...	...	...	*...
S. phippsi	*...	0.3 (2)	0.4 (3)	0.5 (7)	0.5 (5)	0.5 (1)	1.1 (1)	...	...	...	...
S. spinus	...	...	*0.3 (2)	0.3 (3)	0.5 (4)	0.3 (11)	0.5 (4)	0.6 (8)	0.7 (15)	0.8 (6)	0.3 (1)
L. groenlandicus	...	...	...	...	0.3 (4)	0.4 (3)	*0.5 (5)	0.4 (5)	0.4 (4)	0.5 (6)	0.7 (6)
L. polaris	...	...	0.6 (4)	0.4 (12)	*0.4 (14)	0.3 (6)	0.7 (12)	0.7 (13)	1.0 (25)	0.9 (20)	1.0 (17)
E. fabricii	...	...	*...	0.3 (5)	0.4 (6)	0.5 (8)	0.7 (18)	0.6 (10)	0.4 (2)	0.3 (1)	0.5 (1)
E. gaimardi	...	...	0.3 (1)	*0.3 (4)	0.3 (2)	0.3 (3)	0.3 (4)	...	...	...	...
E. g. belcheri	...	...	...	...	0.3 (2)	*...	0.3 (1)	0.3 (5)	1.3 (1)	0.7 (2)	1.2 (4)
E. macilentus	...	...	...	...	...	...	...	0.8 (1)	...	...	...
A. dentata	...	...	...	...	0.2 (2)	*0.4 (3)	0.4 (2)	0.3 (1)	0.4 (1)	0.3 (6)	0.2 (4)
S. boreas	...	...	...	...	...	*0.3 (1)	...	...	0.4 (1)	...	...
S. septemcarinata	...	...	...	...	...	...	*0.3 (1)	...	...	...	1.3 (1)

Table IV. (concl.) Carapace lengths and average egg diameters and indication of first maturity in males and females of shrimp collected by the Calanus Expeditions in Ungava Bay, 1947-1950 (Egg diameter underlined at length which females were observed to be first mature, and an asterisk at length which males were observed to be first mature).

Species	Carapace lengths — mm.											
	15	16	17	18	19	20	21	22	23	24	25	26
P. montagui	...	...	...	...	...	...	...	...	1.0 (2)	...	...	...
S. phippsi	...	...	...	...	...	...	...	...	...	...	...	...
S. spinus	0.5 (2)	...	...	...	...	...	...	...	...	...	...	...
L. groenlandicus	1.1 (4)	1.4 (5)	1.2 (4)	0.9 (14)	1.0 (6)	1.1 (3)	0.8 (1)	2.0 (3)	1.3 (1)	...	...	...
L. polaris	0.9 (10)	0.4 (2)	...	...	...	...	...	...	...	...	...	...
E. fabricii	...	...	...	...	...	...	...	...	...	...	...	...
E. gaimardi	...	...	...	...	...	...	...	...	...	...	...	...
E. g. belcheri	0.5 (1)	...	...	...	...	...	...	...	...	...	...	...
E. macilentus	...	...	...	...	...	...	...	...	...	...	...	...
A. dentata	...	0.4 (4)	1.1 (2)	1.0 (2)	1.6 (5)	...	1.7 (2)	0.6 (1)	...	...	...	...
S. boreas	...	...	...	...	...	...	...	...	1.0 (1)	...	...	1.5 (1)
S. septemcarinata	...	...	...	...	...	...	...	...	...	...	...	...

Pasiphaea tarda, with carapace lengths of 27-42 mm. The smallest and, incidentally, most numerous specimens were in the family Hippolytidae, of which Spirontocaris phippsi (3-10 mm. carapace lengths) and S. spinus (3-15 mm. carapace lengths) were the smallest. Lebbeus groenlandicus (5-25 mm. carapace lengths) was the largest hippolytid. In the specimens examined Eualus gaimardi was somewhat smaller (3-12 mm. carapace lengths) than its closely related form E. gaimardi belcheri (6-15 mm. carapace lengths). Specimens belonging to the family Crangonidae compare in size with the largest hippolytid; its most abundant species, Argis dentata, which had carapace lengths from 4-25 mm., and Sclerocrangon boreas (6-29 mm. carapace lengths) were among the largest specimens of shrimp taken in the shallow areas of Ungava Bay.

Maturities. Gross approximation of maturity was made from diameter of eggs in ovary or on pleopods and from size of appendices masculinae compared with appendices internae (Chace, 1940). Some shrimp which had eggs on the pleopods in June, also had large eggs in the ovary and these would be extruded, undoubtedly, later in the season; however, some which were ovigerous in July and had but small eggs in the ovary were presumed to have just spawned and would carry eggs through the following winter. Most species had spawned by July, although some specimens collected in September still had large eggs in the ovary (Table V). Generally, smaller or first maturing females spawned earlier in the year than larger and presumably already ovigerous females in earlier summer

Table V. Average egg diameters in ovary and on pleopods of shrimp and crabs collected by the Calanus Expeditions in Ungava Bay, June-September, 1947-1950.

Species	June		July		August		September		Average egg diameters on pleopods
	In ovary	On pleopods	In ovary	On pleopods	In ovary	On pleopods	In ovary	On pleopods	
P. tarda	...	...	...	...	0.2 (1)	2.6 (5)	2.5 (1)	3.0 (1)	2.7
P. montagui	...	...	1.0 (2)	...	...	...	...	...	...
S. phippsi	...	...	0.4 (11)	1.4 (5)	0.6 (8)	1.2 (5)	...	1.4 (2)	1.3
S. spinus	0.4 (1)	1.4 (1)	0.5 (32)	1.4 (11)	0.6 (23)	1.5 (5)	...	...	1.4
L. groenlandicus	0.3 (2)	...	0.9 (49)	2.3 (7)	0.6 (20)	2.0 (1)	1.8 (3)	...	2.2
L. polaris	0.5 (3)	2.0 (1)	0.8 (96)	2.1 (25)	0.8 (21)	2.0 (10)	0.5 (15)	1.9 (4)	2.1
E. fabricii	0.9 (1)	...	0.6 (30)	1.2 (2)	0.4 (16)	1.2 (8)	0.4 (4)	0.9 (3)	1.1
E. gaimardi	...	...	0.3 (3)	1.0 (1)	0.3 (10)	1.2 (4)	0.3 (1)	...	1.2
E. g. belcheri	..	...	0.7 (15)	...	0.3 (1)	1.3 (1)	...	...	1.3
E. macilentus	...	1.2 (1)	0.8 (1)	...	...	...	...	...	1.2
A. dentata	...	...	0.7 (31)	2.0 (3)	0.7 (7)	...	...	...	2.0
S. boreas	...	...	0.4 (2)	3.0 (1)	1.3 (2)	3.3 (2)	...	3.1 (6)	3.1
S. septemcarinata	...	...	0.3 (1)	...	1.3 (1)	2.0 (1)	...	...	2.0
P. krøyeri	...	0.9 (2)	...	0.9 (5)	...	0.9 (3)	...	...	0.9
H. coarctatus	...	...	...	0.7 (4)	0.8 (1)	0.7 (11)	...	...	0.7

(Appendix, Tables XXVI-XXXVII). There was evidence that mature females spawned each year. Most early stage larvae were taken in June and July only.

The largest eggs in these species were carried by Sclerocrangon boreas (3.1 mm. average diameter in eggs from 7 specimens) and Pasiphaea tarda (2.7 mm. average diameter in eggs from 6 specimens) (Table V). Among shrimp the smallest eggs were carried by Eualus and Spirontocaris (0.9 to 1.5 mm. range of average egg diameters in 18 and 29 specimens, respectively), which were the smallest shrimp present in general. Lebbeus groenlandicus and L. polaris, also in the family Hippolytidae, had larger eggs than Eualus or Spirontocaris (1.9 to 2.5 mm. range of average egg diameters in 8 and 40 specimens, respectively). The cragonids Argis and Sabinea both had eggs about 2.0 mm. in average diameter in 3 and 1 specimens examined. The hermit crabs (Pagurus) and spider crabs (Hyas) had eggs which averaged less than 1.0 mm. in diameter in 10 and 15 specimens, respectively.

It was observed, generally, that eggs were somewhat less in diameter presumably when first extruded than later, and were largest previous to hatching, namely, when there were large eggs in the ovary as well as on the pleopods (Table V; Appendix, Tables XXVI-XXXVII).

As already stated, females were found first mature (ovigerous or with large eggs in the ovary) in all species of shrimp at a size which exceeded that at which males were found to be first mature (with full length appendices masculinae following a size at which the appendices

masculinae were but half as long as the appendices internae or buds) (Table IV). This difference was probably greatest in the largest species.

Assessment of the decapod fauna of Ungava Bay as shown by the Calanus Expeditions collections

The percentage of dredgings, etc., which took decapods was very high (average, 95%) in the 1947-1950 Calanus Expeditions in Ungava Bay. The percentage of stations at which decapod larvae were taken in plankton hauls was also high (average, 85%) (Fig. 5). The presence of many specimens in stomach contents of fish, seals and sea-birds also attests the considerable quantity of decapods and their importance in the bionomics of the area.

In comparison with adjacent areas, Ungava Bay has a decapod fauna similar to the shallow water areas of West Greenland, and has a few subarctic-boreal elements not found in the Hudson Bay area, as far as is known from collections in these areas. Ungava Bay also shows some incursion from the east of deep-water pelagic species, notably, Pasiphaea tarda and Sergestes arcticus. These species were taken near Port Burwell and Resolution Island, and evidently do not range far into Hudson Strait. Other deep-water pelagic species of Davis Strait and West Greenland have not been taken in the present collections. Although current movements are predominantly out of the Bay and southward along the Labrador coast

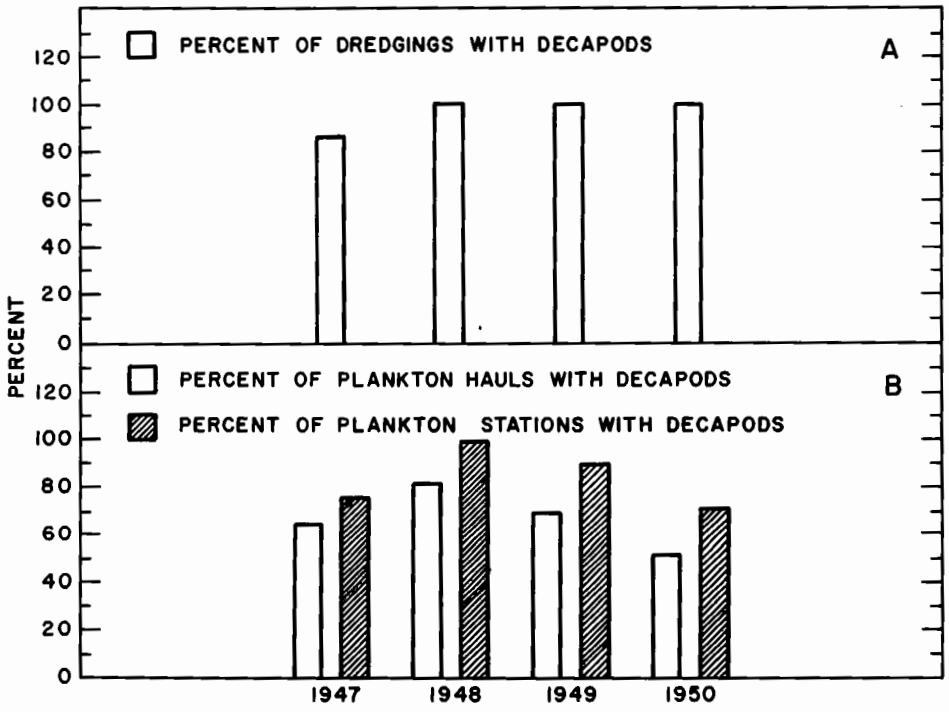

Figure 5. Percentage of dredgings, plankton hauls and plankton stations where decapods were taken in Ungava Bay by the Calanus Expeditions, 1947-1950.

(Dunbar, 1951), there is evidence of Atlantic water in Ungava Bay from hydrographic and plankton results already discussed in this series (Fontaine, 1955). The presence of Pasiphaea and Sergestes in the Calanus Expeditions collections in this area, 1947-1950, supports such a conclusion.

The more typical decapod fauna of Ungava Bay is represented by such species as Argis dentata, Lebbeus groenlandicus, L. polaris, Eualus fabricii, Spirontocaris spinus, Sclerocrangon boreas, Pagurus krøyeri and Hyas coarctatus. These were taken in considerable numbers in dredgings, etc., and as a major constituent of the stomach contents of fish and seals in Ungava Bay, and were well-distributed throughout the area explored. Larvae , also, of these species (except Sclerocrangon which does not have pelagic larvae) were taken in considerable numbers in plankton hauls. No larvae of Sergestes or Pasiphaea were taken in the Bay or areas explored near its entrance during 1947-1950.

Two dominant forms in the area, Argis dentata and Lebbeus groenlandicus, have originated in the Pacific (Stephensen, 1935), and it is easy to see that Ungava Bay can be more readily populated by the spreading of species from the west because of water movements (Dunbar, 1951). Other Pacific species, Eualus fabricii and E. macilentus, are represented in these collections, although Chionoecetes opilio is not: the latter may be restricted to deeper water than explored by the Calanus Expeditions in Ungava Bay. Decapods defined by Stephensen (1935) as exclusively high

arctic are deep water species and presumably would not be found in the shallow water areas of Ungava Bay; this would apply to other deep water but subarctic and boreal species found in nearby waters to the east. Circumpolar species, Lebbeus polaris, Spirontocaris phippsi, S. spinus and Sclerocrangon boreas are well-represented in these collections. Subarctic-boreal species of the North Atlantic, Hyas coarctatus, Spirontocaris liljeborgi and Pandalus montagui are also found in the northern Pacific or the waters north of Behring Strait (Stephensen, 1935), so that they, too, may have reached Ungava Bay from the west. Larvae of Hyas were in large numbers in plankton hauls taken by the Calanus Expeditions, 1947-1950. The pelagic Atlantic species, Sergestes and Pasiphaea, taken at the entrance to Ungava Bay may possibly be considered as accidentals.

A decapod, presumably not from the Pacific but an Atlantic species extending from America to northern Europe (Rathbun, 1929), which is extremely well established in Ungava Bay is the hermit crab, Pagurus krøyeri. Unfortunately, there is some controversy over its identity as a separate species. Hansen (1908) believed that P. krøyeri was synonymous with P. pubescens and perhaps P. trigonocheirus (which is a Pacific form taken north of Alaska (MacGinitie, 1955)). Until this controversy is resolved no conclusions about P. krøyeri can be drawn.

Summary

1. Comparison of decapod species taken in Ungava Bay by the Calanus Expeditions with those taken in the West Greenland, Davis Strait area, shows that there is close similarity particularly between the decapod fauna of Ungava Bay and that of the shallow water areas of West Greenland.

2. A compiled key for all species collected and closely related species emphasizes numbers of exopods, epipods, etc., since these characters help to identify damaged specimens from stomachs of fish and seals.

3. Systematics of the 17 species collected is treated under occurrence in Ungava Bay, world distribution and taxonomy -- the latter referring mostly to variable characters such as number of spines on rostrum, carapace and telson.

4. Pasiphaea tarda and Sergestes arcticus, deep-water pelagic species of the Davis Strait, West Greenland area, were taken for the first time near the entrance to Ungava Bay.

5. Eualus gaimardi and its closely allied form E. gaimardi belcheri were found in similar areas in Ungava Bay. Northern trends toward the form belcheri is shown not to apply in consideration of this collection and others in a limited area of the western Atlantic.

6. Argis dentata, as defined by Rathbun, 1902, was found to be the sole species of this genus in Ungava Bay; and in view of Dr. Rathbun's

naming specimens from Greenland Argis dentata, the distribution of A. lar east of Alaska is questioned.

7. A constant character of a double spine in the centre on the carapace was present in Sclerocrangon boreas and, in the specimens examined, generally larger spines than the typical form. However, in view of intergradations and similar specimens from areas widely separated, no new species naming was proposed.

8. The Calanus Expeditions, 1947-1950, took Eualus macilentus and Sabinea septemcarinata in Ungava Bay for the first time recorded.

9. Ratio of carapace length to rostrum length showed that Hyas coarctatus was present in the typical form and not the form alutaceus in the specimens examined.

10. Equations were calculated to convert carapace lengths to whole lengths in most species of shrimp represented.

11. Lengths of females exceeded males in range in all species of shrimp except P. tarda, and the converse was seen to apply in hermit and spider crabs.

12. P. tarda was the largest species of shrimp taken by the Calanus Expeditions, 1947-1950; but L. groenlandicus, A. dentata and S. boreas were all of fair size and abundance in the shallow areas of the Bay.

13. Male shrimp were found to mature at a size much less than first mature females, which probably accounted for their smaller size in general.

14. Spawning seemed to take place earlier in the year in first maturing females -- some ovigerous in June and July -- than in larger mature females, whose eggs hatched mostly in June and July, and they did not spawn until August or September for the most part.

15. Egg size varied somewhat in a species; eggs just spawned appeared to be smaller, generally (all were measured from about 7% formalin).

16. Largest eggs were carried by Sclerocrangon (3.1 mm. average diameter) and Pasiphaea (average, 2.7 mm.); Lebbeus had eggs 2.0-2.5 mm., Spirontocaris 1.2-1.4 mm., Eualus 1.0-1.2 mm., and Argis and Sabinea about 2.0 mm. in average diameter. Pagurus and Hyas had eggs less than 1.0 mm. in diameter.

17. The percentage of stations where decapods were taken in dredgings and plankton hauls was very high. Also, the occurrence of decapods in stomach contents of many fish and seals show that they occupy an important place in the fauna of Ungava Bay.

18. Some comparison of the decapod fauna of Ungava Bay with adjacent areas is made. The species which typify most the decapod fauna of Ungava Bay are: Argis dentata, Lebbeus groenlandicus, L. polaris, Eualus fabricii, Spirontocaris spinus, Sclerocrangon boreas, Pagurus krøyeri and Hyas coarctatus. L. polaris was the most abundant of all species as in West Greenland.

19. The dominating role of Pacific species of decapods found in Ungava Bay suggests that the area was colonized by decapods from the west for the most part; the presence of Atlantic deep-water forms such as Pasiphaea and Sergestes is accidental.

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APPENDIX

Specimens of decapods were examined from stomach contents of fish and seals as follows (Tables VI-X):

Fish. Cod (Gadus callarias (Linné))

Sculpin (Myoxocephalus groenlandicus Cuvier & Valenciennes)

Seals (Dunbar, 1949).

Harbour seal (Phoca vitulina Linné)

Harp seal (P. groenlandica Erxleben)

Ringed seal (P. hispida Schreber)

Squareflipper (Erignathus barbatus Erxleben)

Length measurement frequencies for each species were made where possible -- when a fair number were taken in good condition (Tables XI-XXV). Standard deviations and standard error were calculated as measures of scatter and variation within species, particularly between males and females.

Average egg diameters at each carapace length were compiled from measurements of eggs in ovary and on pleopods (Tables XXVI-XXXVII).

Average number of variable spines on rostrum, carapace and telson at each carapace length was compiled from counts made for each specimen in good condition (Tables XXXVIII-XLV).

Table VI. Details of stations where decapods were taken by the Calanus Expeditions in Ungava Bay, 1947 (Field notes of M. J. Dunbar and E. H. Grainger), and number of adults.

Station	Depth	Date	Length of tow	Temp. °C.	Salinity °/oo	Gear or predator	Total specimens
	m.		min.				
3	29	29 June	10	-0.60	29.88	Dredge	9
7	10	3 July	7	-0.90	29.40	"	23
11	46	12 "	10	-1.18	30.95	"	31
13	46-55	13 "	30	...	...	Stramin[a]	22
18	84	17 "	20	-1.00	31.87	" [a]	63
20 & 21	64	18 "	10-15	...	...	Dredge	25
27	48	19 "	7	0.36	30.25	"	3
28	27	19 "	7	...	...	"	23
29	...	18 "	...	...	...	Ringed seal	5
30	37	20 "	10	...	...	Dredge	34
33	18-27	10 Aug.	23	1.90	29.40	"	65
33	18-27	10 "	30	...	...	No. 6 net[a]	4
36	48	10 "	10[b]	...	...	Cod	1
44	37-79	19 "	35[b]	0.45	32.18	4 cod	6
45	27-37	23 "	10	...	...	Dredge	64
45	27-37	23 "	40[b]	...	...	53 cod	161
Button Is.	...	21 "	...	...	...	Squareflipper	1
48	14-18	25 "	...	...	...	1 cod	7

[a] Touched bottom
[b] Jigging

Table VII. Details of stations where decapods were taken by the Calanus Expeditions in Ungava Bay, 1948 (Field notes of M. J. Dunbar and E. H. Grainger), and number of adults.

Station	Depth	Date	Length of tow	Gear or predator	Total specimens
	m.		min.		
30 mi. to Burwell from George River	...	Early Feb.	...	Squareflipper	42
Koksoak River	...	1 July	...	"	74
"	...	5 July	...	Ringed seal	136
53	9	10 "	15	Dredge	2
Leaf Bay	...	14 "	...	Ringed seal	1
15 mi. ENE Gyrfalcon Islands	...	15 "	...	Squareflipper	98
"	...	16 "	...	"	31
Off Leaf Bay	...	17 "	...	Ringed seal	3
58	20	28 "	15-30	Dredge	20
59	15	31 "	10	"	79
Tunnusaksuk Fjord	...	2 Aug.	...	Ringed seal	1
74, 77 and 78	15-46	2 "	...	Cod	5
Between Bush and Killinek Islands	...	4 "	...	Harp seal	5
70	0	17 "	...	By hand	1
Keglo Bay	...	18 "	...	Ringed seal	3
Port Burwell	...	29 "	...	Sculpin	3
Off Whale River	...	2 Sept.	...	Squareflipper	128

Table VIII. Details of stations where decapods were taken by the Calanus Expeditions in Ungava Bay, 1949 (Field notes of M. J. Dunbar and E. H. Grainger), and number of adults.

Station	Depth	Date	Length of tow	Temp. °C.	Salinity °/oo	Gear or predator	Total specimens
	m.		min.				
102	90-130	30 June	15	...	...	Dredge and beam-trawl	30
Burwell Hr.	...	30 "	...	...	...	Ringed seal	9
103	145-275	6 July	30+15	-0.46	33.53	Dredge and beam-trawl	139
103	128	7 "	30	-0.55	...	Stramin net[a]	38
106	100-110	7 "	30	...	...	Dredge	12
107	55-73	7 "	10	...	...	"	29
Mission Cove	...	9 "	...	...	...	Ringed seal	1
Burwell	...	11 "	...	...	...	" "	60
105	15-28	3 Aug.	...	...	...	Squareflipper	6
105	15-28	3 "	...	-0.28	31.27	Ca. 100 cod	205
Button Is.	...	5,6 "	...	...	...	3 harbour seals	142
123	5-15	10 "	5+22	0.99	32.38	00 and 0 nets	137
Payne Bay	...	20 "	...	...	...	Squareflipper	22
124	0	20 "	(8 hr.[b])..		...	Stramin net	17
126	70-91	23 "	65	2.07	31.87	Dredge	47
128	40 (185 deep)	24 "	70	3.40	31.92	No. 00 net	27

[a] On bottom
[b] Current

Table IX. Details of stations where decapods were taken by the Calanus Expeditions in Ungava Bay, 1950 (Field notes of M. J. Dunbar and E. H. Grainger), and number of adults.

Station	Depth	Date	Length of tow	Temp. °C.	Salinity °/oo	Gear or predator	Total specimens
	m.		min.				
C. Hopes Advance	...	19 Apr.	...	...	...	Squareflipper	67
"	...	26 "	...	...	...	Ringed seal	31
201C	80-100	29 June	30	3.10	29.76	Dredge	18
202	...	3 July	...	...	...	Squareflipper	185
203	30	8 "	20	...	...	Dredge	33
204	0	9 "	...	...	...	By hand	1
205	0-18	14 "	...	1.21	30.55	Ringed seal	3
206	55-90	14 "	15	...	...	Dredge	6
208	80-90	20 "	20	-1.39	33.42	"	41
210	90-110	21 "	25	...	...	"	54
212	shallow	22 "	...	...	...	Squareflipper	13
215	0	24 "	...	...	...	By hand	1
216	18-22	24 "	5	...	...	Dredge	6
222	80-90	3 Aug.	12	-1.22	33.42	"	68
224	18-60	10 "	...	...	...	35 cod	34
226	90-100	13 "	5	...	...	Dredge	25
227	0-20	13 "	...	0.95	31.82	4 harbour seals	1
224	18-60	15 "	...	...	...	69 cod	27
231	63-90	27 "	5	...	...	Dredge	5
234	82-90	31 "	30	1.24	31.55	No. 0 net[a]	3
236	...	2 Sept.	...	...	...	Squareflipper	138
AS28	20-37	1-7 "	...	...	...	Cod	111
AS28	20-37	6 "	...	...	...	Shrimp net	116
AS28	20-37	3-8 "	...	...	...	Cod	20

[a]Touched bottom

Table X. Numbers of specimens of each species of decapod taken by (a) nets and dredge in Ungava Bay by the Calanus Expeditions, 1947-1950.

Species	Dredge and beam-trawl	Stramin	No. 6 (Touched bottom)	No. 0 (Touched bottom)	No. 00 No. 5	Shrimp net
S. arcticus	...	...	...	...	...	88
P. tarda	...	...	...	...	...	...
P. montagui	11	3	...	...	...	...
S. liljeborgi	...	...	...	...	...	...
S. phippsi	24	21	...	...	...	...
S. spinus	77	34	...	...	...	...
L. groenlandicus	159	7	...	...	...	2
L. polaris	211	23	...	...	125	19
E. fabricii	173	44	...	...	39	6
E. gaimardi	34	1	4	3	...	1
E. g. belcheri	23	6	...	...	...	...
E. macilentus	1	...	...	...	...	...
A. dentata	67	...	...	...	...	...
S. boreas	9	...	...	...	...	...
S. septemcarinata	4	...	...	...	...	...
P. krøyeri	60	1	...	...	...	...
H. coarctatus	37	...	...	...	...	...
Hippolytid	1	...	...	...	...	...
Decapod	...	...	...	...	...	...
Totals	891	140	4	3	164	116

Table X. (concl.) Numbers of specimens of each species of decapod taken by (b) hand and from stomach contents of fish and seals in Ungava Bay by the Calanus Expeditions, 1947-1950.

Species	Cod	Ringed seal	Square-flipper	Harbour seal	Harp seal	Sculpin	By hand	Grand total
S. arcticus	174	1	...	...	4	...	...	267
P. tarda	46	...	...	...	...	...	...	46
P. montagui	37	29	1	...	...	...	...	81
S. liljeborgi	...	...	2	...	...	...	...	2
S. phippsi	18	32	36	6	...	...	...	137
S. spinus	47	3	21	3	...	...	...	185
L. groenlandicus	40	14	176	15	...	...	...	413
L. polaris	69	13	8	5	...	...	...	473
E. fabricii	70	37	27	20	...	...	...	416
E. gaimardi	33	23	3	...	...	...	...	102
E. g. belcheri	7	3	6	1	...	...	...	46
E. macilentus	...	3	...	...	...	...	...	4
A. dentata	7	6	253	7	...	...	...	340
S. boreas	1	39	174	4	...	...	...	227
S. septemcarinata	7	...	1	...	...	...	...	12
P. krøyeri	9	...	...	...	...	...	...	70
H. coarctatus	10	1	20	4	...	3	3	78
Hippolytid	2	16	27	78	...	...	...	124
Decapod	...	33	18[a]	...	1	...	...	52
Totals	577	253	773	143	5	3	3	3,075

[a]In addition, many were in smaller fragments and could not be counted.

Table XI. Carapace length frequencies of Sergestes arcticus, collected by the Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	Males					Females				
	1947	1948	1949	1950	Total	1947	1948	1949	1950	Total
mm.										
9	...	...	...	4	4	...	...	...	2	2
10	...	...	...	20	20	...	...	...	6	6
11	...	...	1	8	9	3	...	...	11	14
12	3	...	0	17	20	1	...	...	15	16
13	1	...	3	8	12	3	...	1	15	19
14	1	...	0	1	2	3	...	0	6	9
15	...	...	3	...	3	3	1	2	5	11
16	...	...	...	...	...	3	...	...	1	4
Totals	5	0	7	58	70	16	1	3	61	81
Averages	13	...	14	11	11	14	...	14	12	13
Standard deviation	0.8	...	1.40	1.27	1.48	1.44	...	...	1.54	1.77
S. error	0.36	...	0.53	0.17	0.18	0.36	...	...	0.20	0.20

Table XII. Carapace length frequencies of Pasiphaea tarda, collected by the Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	Males 1949	Males 1950	Males Total	Females 1949	Females 1950	Females Total
mm.						
18 - 20	...	...	...	1	...	1
21 - 23	...	...	...	0	...	0
24 - 26	...	...	...	0	1	1
27 - 29	...	...	...	1	0	1
30 - 32	1	...	1	0	0	0
33 - 35	0	...	0	2	1	3
36 - 38	1	...	1	2	0	2
39 - 41	...	1	1	0	1	1
42 - 44	...	1	1	1	...	1
Totals	2	2	4	7	3	10
Averages	35	42	38	33	33	33
Standard deviation	...	...	4.44	7.14	...	6.84
S. error	...	...	1.48	2.70	...	2.16

Table XIII. Carapace length frequencies of Pandalus montagui, collected by the Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	Males 1947	1949	1950	Total	Females 1947	1949	1950	Total
mm.								
10	2	...	...	2	...	...	...	...
11	4	1	...	5	...	...	...	...
12	1	4	...	5	...	...	...	...
13	1	4	...	5	...	...	...	...
14	0	2	...	2	...	...	...	...
15	1	...	1	2	...	...	...	...
16	0	...	...	0	...	...	...	...
17	0	...	...	0	...	...	...	...
18	1	...	...	1	...	...	...	...
19	...	...	...	...	...	...	...	...
20	...	...	...	...	1	...	...	1
21	...	...	...	...	0	...	...	0
22	...	...	...	...	0	...	...	0
23	...	...	...	...	4	4	...	8
24	...	...	...	...	2	2	...	4
25	...	...	...	...	1	2	1	4
Totals	10	11	1	22	8	8	1	17
Averages	12	13	...	13	23	24	...	24
Standard deviation	2.40	0.93	...	1.95	1.36	0.83	...	1.21
S. error	0.75	0.28	...	0.42	0.48	0.29	...	0.29

Table XIV. Carapace length frequencies of Spirontocaris phippsi, collected by the Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	Males 1947	1948	1949	1950	Total	Females 1947	1948	1949	1950	Total
mm.										
3	1	...	...	...	1	4	...	...	...	4
4	5	...	...	...	5	0	...	1	...	1
5	...	1	...	...	1	5	...	0	2	7
6	...	...	...	1	1	3	3	1	0	7
7	...	...	...	...	...	4	9	2	0	15
8	...	...	...	...	...	2	15	4	5	26
9	...	...	...	...	...	...	3	1	3	7
10	...	...	...	...	...	...	1	...	...	1
Totals	6	1	0	1	8	18	31	9	10	68
Averages	4	...	...	...	4	6	8	7	8	7
Standard deviation	...	...	...	...	0.66	1.64	0.82	1.26	1.42	1.59
S. error	...	...	...	...	0.14	0.39	0.15	0.42	0.45	0.19

Table XV. Carapace length frequencies of Spirontocaris spinus, collected by the Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	Males					Females				
	1947	1948	1949	1950	Total	1947	1948	1949	1950	Total
mm.										
3	2	...	1	...	3	2	...	...	...	2
4	2	...	1	...	3	0	...	...	...	0
5	2	...	0	...	2	2	...	2	...	4
6	1	...	2	1	4	2	...	0	1	3
7	2	...	0	4	6	4	...	0	2	6
8	1	...	3	2	6	5	...	0	8	13
9	2	...	5	6	13	0	3	6	5	14
10	2	...	2	2	6	1	0	4	0	5
11	...	...	...	3	3	0	0	7	4	11
12	...	...	...	1	1	1	0	10	6	17
13	...	...	...	...	...	...	1	5	1	7
14	...	...	...	...	...	...	...	1	1	2
15	...	...	...	...	...	...	...	...	2	2
Totals	14	0	14	19	47	17	4	35	30	86
Averages	6	...	8	9	8	7	10	11	10	10
Standard deviation	2.42	...	2.08	1.62	2.22	2.44	1.99	1.99	2.40	2.61
S. error	0.65	...	0.56	0.37	0.32	0.59	1.00	0.34	0.44	0.28

Table XVI. Carapace length frequencies of Lebbeus groenlandicus, collected by the Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	Males					Females				
	1947	1948	1949	1950	Total	1947	1948	1949	1950	Total
mm.										
4, 5	...	...	...	...	...	1	2	...	...	3
6, 7	...	...	...	1	1	4	2	4	2	12
8, 9	2	4	...	0	6	6	2	0	2	10
10,11	20	2	5	3	30	4	4	3	4	15
12,13	16	6	5	5	32	7	2	4	3	16
14,15	2	8	5	9	24	10	1	1	4	16
16,17	1	1	1	2	5	3	1	5	3	12
18,19	...	...	1	...	1	6	1	13	9	29
20,21	...	...	...	...	...	2	1	2	3	8
22,23	...	...	...	...	...	...	2	4	3	9
24,25	...	...	...	...	...	...	...	...	1	1
Totals	41	21	17	20	99	43	18	36	34	131
Averages	11	12	13	13	12	13	12	15	16	14
Standard deviation	1.58	2.39	2.38	2.59	2.65	4.04	5.58	4.30	4.72	4.89
S. error	0.25	0.52	0.58	0.58	0.27	0.62	1.38	0.72	0.81	0.43

Table XVII. Carapace length frequencies of Lebbeus polaris, collected by the Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	Males					Females					Juveniles
	1947	1948	1949	1950	Total	1947	1948	1949	1950	Total	
mm.											
3	...	...	1	...	1	...	1	...	...	1	5
4	1	...	1	...	2	1	0	...	...	1	70
5	4	...	5	1	10	4	0	4	...	8	
6	0	...	8	0	8	2	0	9	2	13	
7	2	2	8	1	13	1	2	8	7	18	
8	5	3	2	4	14	1	11	2	9	23	
9	7	5	4	4	20	4	4	1	7	16	
10	1	4	9	5	19	4	6	2	5	17	
11	1	...	13	10	24	5	9	6	4	24	
12	1	...	7	2	10	5	8	6	12	31	
13	...	...	1	...	1	3	2	10	8	23	
14	...	...	...	...	...	1	4	9	6	20	
15	...	...	...	...	...	...	...	6	3	9	
16	...	...	...	...	...	...	...	1	1	2	
Totals	22	14	59	27	122	31	47	64	64	206	75
Averages	8	9	9	10	9	10	10	11	11	10	4
Standard deviation	1.81	1.02	2.53	1.61	2.11	2.75	2.29	3.46	2.51	2.82	...
S. error	0.43	0.27	0.33	0.31	0.19	0.49	0.34	0.43	0.31	0.20	...

Table XVIII. Carapace length frequencies of Eualus fabricii, collected by the Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	Males 1947	1948	1949	1950	Total	Females 1947	1948	1949	1950	Total	Juveniles
mm.											
3	...	...	...	...	...	...	...	...	...	...	11
4	...	...	1	...	1	3	...	3	...	6	
5	3	...	1	...	4	0	...	0	...	0	
6	6	...	6	5	17	7	...	3	4	14	
7	24	1	16	6	47	8	2	1	2	13	
8	18	0	7	1	26	17	3	4	1	25	
9	4	2	7	1	14	22	8	5	4	39	
10	1	...	4	0	5	21	2	17	5	45	
11	0	...	1	1	2	5	3	11	8	27	
12	1	...	...	...	1	2	...	3	5	10	
13	...	...	...	...	...	0	...	1	0	1	
14	...	...	...	...	...	0	...	1	1	2	
15	...	...	...	...	...	1	...	...	...	1	
Totals	57	3	43	14	117	86	18	49	30	183	
Averages	7	8	8	7	7	9	9	10	10	9	
Standard deviation	1.17	...	1.45	1.36	1.32	1.72	1.18	2.14	2.10	1.95	
S. error	0.15	...	0.22	0.36	0.11	0.19	0.28	0.31	0.38	0.14	

Table XIX. Carapace length frequencies of Eualus gaimardi, collected by the Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	Males					Females					Juve-niles
	1947	1948	1949	1950	Total	1947	1948	1949	1950	Total	
mm.											
3	...	...	...	...	...	...	...	...	...	...	2
4	...	...	...	...	...	...	...	...	...	...	3
5	...	...	...	...	...	...	...	...	...	...	
6	3	...	...	...	3	1	...	2	...	3	
7	4	...	...	2	6	10	...	2	...	12	
8	0	1	...	1	2	0	...	3	...	3	
9	0	...	...	1	1	6	...	2	1	9	
10	1	...	...	...	1	4	...	1	2	7	
11	...	...	...	...	...	2	...	...	...	2	
12	...	...	...	...	...	1	...	...	...	1	
Totals	8	1	0	4	13	24	0	10	3	37	5
Averages	7	...	...	7	7	9	...	8	10	8	4
Standard deviation	1.50	...	...	...	1.17	1.70	...	1.25	...	1.52	...
S. error	0.53	...	...	...	0.31	0.36	...	0.40	...	0.24	...

Table XX. Carapace length frequencies of Eualus gaimardi belcheri, collected by the Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	Males				Females			
	1947	1949	1950	Total	1947	1949	1950	Total
mm.								
6	2	...	1	3	...	...	...	...
7	2	...	2	4	1	1	...	2
8	1	...	1	2	0	4	...	4
9	0	2	...	2	1	0	...	1
10	0	4	...	4	1	2	...	3
11	0	0	...	0	1	4	...	5
12	0	3	...	3	1	2	...	3
13	2	0	...	2	...	3	...	3
14	1	1	...	2	...	3	...	3
15	...	...	...	...	...	1	...	1
Totals	8	10	4	18	5	20	0	25
Averages	9	11	7	9	10	11	...	11
Standard deviation	3.14	1.54	0.50	2.89	1.63	2.38	...	2.28
S. error	1.11	0.48	0.25	0.68	0.73	0.53	...	0.46

Table XXI. Carapace length frequencies of Argis dentata, collected by the Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	Males					Females					Juveniles
	1947	1948	1949	1950	Total	1947	1948	1949	1950	Total	
mm.											
4, 5	...	...	...	...	...	...	...	...	...	...	2
6, 7	...	...	...	...	...	1	...	...	...	1	3
8, 9	4	...	2	4	10	3	3	1	2	9	
10,11	1	1	4	0	7	5	0	3	1	9	
12,13	...	1	1	7	9	...	2	1	2	5	
14,15	...	2	0	6	7	...	3	7	3	13	
16,17	...	1	1	0	2	...	0	4	0	4	
18,19	...	0	...	0	0	...	1	4	1	6	
20,21	...	0	...	0	0	...	2	4	6	12	
22,23	...	1	...	2	3	...	2	3	6	11	
24,25	...	1	...	2	3	...	...	...	3	3	
Totals	5	7	8	21	41	9	13	27	24	73	5
Averages	9	16	11	15	13	9	15	16	19	16	6
Standard deviation	0.75	1.14	2.22	4.85	5.00	1.21	4.97	3.68	5.12	5.08	
S. error	0.25	0.43	0.79	1.06	0.78	0.40	1.38	0.71	1.05	0.64	

Table XXII. Carapace length frequencies of Sclerocrangon boreas, collected by the Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	Males					Females				
	1947	1948	1949	1950	Total	1947	1948	1949	1950	Total
mm.										
6, 7	...	...	...	...	...	...	...	1	...	1
8, 9	1	1	...	1	3	...	2	0	1	3
10,11	1	1	...	0	2	...	0	0	0	0
12,13	0	1	...	0	1	...	1	0	1	2
14,15	0	0	...	0	0	...	1	0	1	2
16,17	1	1	...	1	3	...	0	0	2	2
18,19	...	0	...	4	4	...	0	0	1	1
20,21	...	0	...	2	2	...	1	0	5	6
22,23	...	0	...	...	0	2	0	0	1	3
24,25	...	1	...	...	1	...	5	0	7	12
26,27	...	...	...	...	...	...	3	1	10	14
28,29	...	...	...	...	...	...	...	1	1	2
Totals	3	5	0	8	16	2	13	3	30	48
Averages	11	14	...	17	16	23	20	20	23	22
Standard deviation	...	5.74	...	3.62	4.84	...	6.68	...	4.64	5.58
S. error	...	2.56	...	1.28	1.21	...	1.86	...	0.85	0.80

XXIII. Carapace length frequencies of Sabinea septemcarinata, collected by the Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace length	Males				Females			
	1947	1949	1950	Total	1947	1949	1950	Total
mm.								
8	...	...	...	...	...	...	1	1
9	...	...	...	...	...	...	2	2
10	...	...	1	1	...	1	0	1
11	1	1	...	2	...	...	0	0
12	...	0	...	0	...	...	0	0
13	...	1	...	1	...	...	0	0
14	...	...	...	...	1	...	0	1
15	...	...	...	...	1	...	0	1
16	...	...	...	...	...	...	0	0
17	...	...	...	...	...	...	1	1
18	...	...	...	...	...	...	0	0
19	...	...	...	...	...	...	1	1
Totals	1	2	1	4	2	1	5	8
Averages	...	12	...	11	15	...	12	13
Standard deviation	...	...	...	1.09	...	...	4.63	3.92
S. error	...	...	...	0.55	...	...	2.68	1.39

Table XXIV. Carapace length frequencies of Pagurus krøyeri, collected by the Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	Males					Females				
	1947	1948	1949	1950	Total	1947	1948	1949	1950	Total
mm.										
4, 5	...	...	...	...	...	1	...	...	...	1
6, 7	...	2	...	...	2	1	...	4	1	6
8, 9	1	1	2	3	7	4	...	3	1	8
10,11	0	...	0	5	5	2	...	0	3	5
12,13	2	...	1	1	4	3	...	0	2	5
14,15	2	...	0	0	2	1	...	0	0	1
16,17	2	...	1	0	3	1	...	0	2	3
18,19	0	...	...	0	0	1	...	2	...	3
20,21	1	...	...	1	2	...	...	...	...	...
22,23	1	...	...	...	1	...	...	...	...	...
24,25	1	...	...	...	1	...	...	...	...	...
Totals	10	3	4	10	27	14	0	9	9	32
Averages	16	7	12	11	13	11	0	10	12	11
Standard deviation	4.52	...	3.51	3.37	4.58	3.61	...	5.36	2.94	3.82
S. error	1.43	...	1.76	1.07	0.88	0.97	...	1.79	0.98	0.67

Table XXV. Carapace length frequencies of Hyas coarctatus, collected by the Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace length	Males					Females				
	1947	1948	1949	1950	Total	1947	1948	1949	1950	Total
mm.										
5-9	...	...	...	1	1	...	...	...	...	...
10-14	...	...	...	0	0	...	...	...	...	...
15-19	...	...	1	0	1	...	...	1	...	1
20-24	...	...	1	0	1	...	...	0	...	0
25-29	1	...	2	3	6	...	...	2	...	2
30-34	0	...	0	0	0	...	...	3	...	3
35-39	0	...	0	1	1	...	...	2	2	4
40-44	1	...	1	...	2	1	...	1	4	6
45-49	...	...	1	...	1	...	...	1	1	2
50-54	...	1	1	...	2	...	...	...	...	...
55-59	...	0	0	...	0	...	...	...	...	...
60-64	...	0	1	...	1	...	...	...	...	...
65-69	...	0	...	...	0	...	...	...	...	...
70-74	...	0	...	...	0	...	...	...	...	...
75-79	...	1	...	...	1	...	...	...	...	...
80-84	...	0	...	...	0	...	...	...	...	...
85-89	...	1	...	...	1	...	...	...	...	...
Totals	2	3	8	5	18	1	0	10	7	18
Averages	36	72	39	25	40	...	...	35	41	37
Standard deviation	...	...	...	...	20.85	...	...	8.00	...	6.50
S. error	...	...	...	...	5.07	...	...	2.53	...	1.53

Table XXVI. Average egg diameters in ovary and on pleopods of Pasiphaea tarda, of the Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	August		September	
	In ovary	On pleopods	In ovary	On pleopods
mm.	mm.	mm.	mm.	mm.
27-29	0.2(1)	...	...	...
30-32	...	...	...	...
33-35	...	...	2.5(1)	...
36-38	...	2.5(1)	...	...
39-41	...	...	...	3.0(1)
42-44	...	2.7(1)	...	...
No length	...	2.6(3)	...	...
Totals	1	5	1	1
Averages	...	2.6	...	...
Range	...	2.3-3.0	...	...

Table XXVI. Average egg diameters in ovary and on pleopods of Spirontocaris phippsi, of the Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	July		August		September	
	In ovary	On pleopods	In ovary	On pleopods	In ovary	On pleopods
mm.	mm.	mm.	mm.	mm.	mm.	mm.
5	0.3(2)	...	...	...	...	...
6	0.3(1)	1.3(1)	0.5(2)	...	...	...
7	0.5(2)	...	0.5(5)	1.3(3)	...	...
8	0.4(4)	1.4(3)	0.7(1)	1.3(2)	...	1.4(2)
9	0.5(1)	...	...	...	...	...
10	1.1(1)	1.5(1)	...	...	...	...
Totals	11	5	8	5	0	2
Averages	0.4	1.4	0.6	1.2	...	1.4
Range	0.3-0.6	1.2-1.5	0.3-0.8	1.1-1.4	...	1.3-1.5

Table XXVIII. Average egg diameters in ovary and on pleopods of Spirontocaris spinus, of the Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	June		July		August	
	In ovary	On pleopods	In ovary	On pleopods	In ovary	On pleopods
mm.	mm.	mm.	mm.	mm.	mm.	mm.
6	...	...	0.3(2)	...	...	...
7	0.4(1)	...	0.3(2)	...	...	...
8	...	...	0.5(4)	1.2(2)	...	...
9	...	...	0.3(6)	1.4(2)	0.4(5)	...
10	...	...	0.5(3)	1.5(2)	0.3(1)	1.3(1)
11	...	...	0.5(6)	1.5(1)	0.7(2)	...
12	...	...	0.5(6)	1.5(1)	0.8(9)	1.5(2)
13	...	...	0.7(3)	1.6(3)	0.8(3)	...
14	...	...	...	...	0.3(1)	1.6(1)
15	...	...	...	...	0.5(2)	1.6(1)
16	...	1.4(1)	...	...	...	...
Totals	1	1	32	11	23	5
Averages	...	...	0.5	1.4	0.6	1.5
Range	...	...	0.3-1.2	1.0-1.8	0.3-1.0	1.3-1.6

Table XXIX. Average egg diameters in ovary and on pleopods of Lebbeus groenlandicus, of the Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	June		July		August		September	
	In ovary	On pleopods	In ovary	On pleopods	In ovary	On pleopods	In ovary	On pleopods
mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
8	...	...	0.3(2)	...	0.3(2)	...	...	...
9	...	...	0.4(3)	...	...	...	...	...
10	...	...	0.5(5)	...	...	...	...	...
11	...	...	0.4(2)	...	0.4(3)	...	...	...
12	0.3(1)	...	0.4(3)	...	...	...	...	...
13	...	...	0.6(2)	...	0.5(4)	...	...	...
14	0.3(1)	...	1.1(3)	...	0.3(2)	...	...	...
15	...	...	1.3(3)	...	0.5(1)	...	...	...
16	...	...	1.4(5)	...	...	...	...	...
17	...	...	1.3(3)	...	0.8(1)	...	...	...
18	...	...	0.8(10)	2.2(4)	0.8(3)	2.0(1)	2.0(1)	...
19	...	...	1.0(3)	2.3(2)	0.7(2)	...	1.5(1)	...
20	...	...	1.1(3)	2.4(1)	...	...	...	...
21	...	...	...	...	0.8(1)	...	0.6(1)	...
22	...	...	2.0(2)	...	...	...	2.0(1)	...
23	...	...	...	...	1.3(1)	...	...	...
Totals	2	0	49	7	20	1	4	0
Averages	0.3	...	0.9	2.3	0.6	...	1.8	...
Range	...	...	0.3-2.0	2.1-2.4	0.3-1.3	...	0.6-2.0	...

Table XXX. Average egg diameters in ovary and on pleopods of *Lebbeus polaris*, of the *Calanus* Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	June		July		August		September	
	In ovary	On pleopods	In ovary	On pleopods	In ovary	On pleopods	In ovary	On pleopods
mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
6	...	...	1.4(1)	...	0.3(2)	...	0.3(1)	...
7	...	...	0.4(6)	1.5(1)	0.3(2)	...	0.4(4)	...
8	...	...	0.4(13)	...	0.3(1)	...	...	...
9	...	...	0.3(5)	...	...	...	0.4(1)	...
10	0.8(1)	...	0.8(7)	...	0.4(2)	...	0.4(2)	...
11	0.3(2)	2.0(1)	0.8(10)	2.1(2)	0.5(1)	1.8(2)	...	...
12	...	...	0.9(21)	2.1(6)	1.3(4)	2.0(3)	...	2.0(1)
13	...	...	1.0(13)	2.2(8)	0.5(4)	2.2(3)	0.9(3)	...
14	...	...	0.8(11)	2.2(5)	1.5(5)	1.9(2)	0.4(1)	2.0(1)
15	...	...	1.0(8)	2.3(2)	...	...	0.3(2)	1.8(2)
16	...	...	0.3(1)	2.6(1)	...	...	0.4(1)	1.9(1)
Totals	3	1	96	25	21	10	15	4
Averages	0.5	...	0.8	2.1	0.8	2.0	0.5	1.9
Range	0.3-0.8	...	0.3-2.0	2.0-2.4	0.3-2.3	1.8-2.7	0.3-1.0	1.5-2.0

Table XXXI. Average egg diameters in ovary and on pleopods of Eualus fabricii, of the Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	June		July		August		September	
	In ovary	On pleopods	In ovary	On pleopods	In ovary	On pleopods	In ovary	On pleopods
mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
7	...	...	0.3(2)	...	0.3(2)	...	0.4(1)	...
8	...	...	0.5(4)	...	0.3(2)	...	...	...
9	...	...	0.7(4)	1.2(1)	0.3(4)	1.2(2)	...	...
10	0.9(1)	...	0.7(9)	...	0.6(7)	1.1(5)	0.4(1)	0.9(1)
11	...	...	0.6(9)	...	0.3(1)	1.2(1)	...	...
12	...	...	...	...	...	...	0.4(2)	0.9(2)
13	...	...	0.3(1)	1.2(1)	...	...	...	...
14	...	...	0.5(1)	...	...	...	...	...
Totals	1	0	30	2	16	8	4	3
Averages	...	...	0.6	1.2	0.4	1.2	0.4	0.9
Range	...	...	0.3-1.1	1.2	0.3-1.0	1.0-1.2	0.3-0.4	0.9

Table XXXII. Average egg diameters in ovary and on pleopods of Eualus gaimardi; Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	July		August		September	
	In ovary	On pleopods	In ovary	On pleopods	In ovary	On pleopods
mm.	mm.	mm.	mm.	mm.	mm.	mm.
6	0.3(1)	...	...	...	...	...
7	...	...	0.3(4)	...	...	...
8	0.3(1)	...	0.3(1)	...	...	...
9	0.3(1)	...	0.3(2)	...	...	...
10	...	...	0.3(3)	1.2(3)	0.3(1)	...
11	...	1.0(1)	...	1.1(1)	...	...
Totals	3	1	10	4	1	0
Averages	0.3	...	0.3	1.2	...	...
Range	0.3	...	0.3-0.4	1.1-1.2	...	...

Table XXXIII. Average egg diameters in ovary and on pleopods of Eualus gaimardi belcheri; Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	J u l y		A u g u s t	
	In ovary	On pleopods	In ovary	On pleopods
mm.	mm.	mm.	mm.	mm.
8	0.3(1)	...	0.3(1)	...
9	...	...	...	...
10	0.3(1)	...	...	...
11	0.3(5)	...	...	...
12	1.3(1)	...	...	1.3(1)
13	0.7(2)	...	...	...
14	1.2(4)	...	...	...
15	0.5(1)	...	...	...
Totals	15	0	1	1
Average	0.7	...	...	...
Range	0.3-1.5	...	...	...

Table XXXIV. Average egg diameters in ovary and on pleopods of Argis dentata; Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	J u l y		A u g u s t	
	In ovary	On pleopods	In ovary	On pleopods
mm.	mm.	mm.	mm.	mm.
8, 9	0.1(2)	...	0.4(3)	...
10,11	0.2(3)	...	0.5(2)	...
12,13	0.4(2)	...	...	...
14,15	0.3(10)	...	...	...
16,17	0.4(4)	...	...	...
18,19	1.0(3)	2.0(1)	1.5(1)	...
20,21	1.6(5)	2.0(2)	...	...
22,23	1.2(2)	...	1.5(1)	...
Totals	31	3	7	0
Averages	0.7	2.0	0.7	...
Range	0.1-2.0	2.0	0.6-1.5	...

Table XXXV. Average egg diameters in ovary and on pleopods of Sclerocrangon boreas; Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	July		August		September	
	In ovary	On pleopods	In ovary	On pleopods	In ovary	On pleopods
	mm.	mm.	mm.	mm.	mm.	mm.
8, 9	0.3(1)	...	...	...	...	...
10,11	...	...	...	...	...	...
12,13	0.4(1)	...	...	...	...	...
14,15	...	...	...	...	...	...
16,17	...	...	...	...	...	...
18,19	...	...	...	...	...	...
20,21	...	...	...	...	...	...
22,23	...	...	1.0(1)	...	...	...
24,25	...	...	...	...	...	3.0(4)
26,27	...	3.0(1)	1.5(1)	3.0(1)	...	3.3(2)
28,29	...	...	...	3.5(1)	...	...
Totals	2	1	2	2	0	6
Averages	0.4	...	1.3	3.3	...	3.1
Range	0.3-0.4	3.0	1.0-1.5	3.0-3.5	...	2.9-3.5

Table XXXVI. Average egg diameters on pleopods of Pagurus krøyeri, taken by the Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	June On pleopods	July On pleopods	August On pleopods
mm.	mm.	mm.	mm.
4, 5	...	1.1(1)	...
6, 7	...	0.9(3)	...
8, 9	...	...	...
10,11	...	...	...
12,13	...	...	...
14,15	...	...	0.8(1)
16,17	0.9(2)	...	...
18,19	...	...	1.0(1)
20,21	...	0.9(1)	1.0(1)
Totals	2	5	3
Averages	0.9	0.9	0.9
Range	0.8-1.0	0.7-1.1	0.8-1.0

Table XXXVII. Average egg diameters in ovary and on pleopods of Hyas coarctatus; Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	July		August	
	In ovary	On pleopods	In ovary	On pleopods
mm.	mm.	mm.	mm.	mm.
28,29	...	...	...	0.7(1)
30,31	...	...	...	...
32,33	...	...	...	0.7(4)
34,35	...	0.7(1)	...	0.6(1)
36,37	...	...	...	0.8(1)
38,39	...	...	...	0.8(1)
40,41	...	0.7(1)	0.8(1)	0.7(1)
42,43	...	...	...	0.7(1)
44,45	...	...	...	0.7(1)
46,47	...	0.7(1)	...	...
48,49	...	0.7(1)	...	...
Totals	0	4	1	11
Averages	...	0.7	...	0.7
Range	...	0.7	0.8	0.6-0.8

Table XXXVIII. Average number of spines on rostrum, carapace and telson in Pandalus montagui; Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	On rostrum			Laterally on telson		
	Below	Above	Carapacial	Right	Left	
mm.						
10	5(1)	5(1)	5(1)	4(1)	4(1)	
11	5(5)	5(5)	5(5)	4(4)	4(4)	
12	5(3)	8(3)	3(2)	4(2)	4(2)	
13	5(4)	5(3)	6(2)	5(4)	5(4)	
14	5(1)	5(1)	4(1)	4(1)	5(1)	
Totals	14	13	11	12	12	
Averages	5	5	5	4	5	Males
Range	4-6	4-10	2-7	4-6	4-6	
23	5(2)	8(2)	4(2)	4(3)	4(3)	
24	5(1)	4(1)	6(1)	4(1)	4(1)	
25	5(2)	7(2)	7(1)	5(2)	5(2)	
Totals	5	5	4	6	6	
Averages	5	7	5	4	4	Females
Range	4-5	4-10	3-7	4-5	4-5	

Table XXXIX. Average number of spines on rostrum, carapace and telson in Spirontocaris phippsi; Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	Males					Females				
	On rostrum			On telson		On rostrum			On telson	
	Below	Above	Cara-pacial	Right	Left	Below	Above	Cara-pacial	Right	Left
mm.										
4	4(2)	4(2)	3(2)	4(2)	5(2)	5(1)	5(1)	5(1)	3(1)	3(1)
5	4(1)	3(1)	3(1)	4(1)	4(1)	5(2)	6(2)	4(3)	4(1)	4(1)
6	...	...	...	5(1)	5(1)	7(3)	6(2)	5(2)	4(2)	4(2)
7	...	...	...	...	...	5(6)	6(6)	5(6)	4(5)	4(5)
8	...	...	...	...	...	6(12)	6(12)	4(11)	4(11)	4(10)
9	...	...	...	...	...	6(2)	7(2)	5(2)	4(1)	2(1)
10	...	...	...	...	...	7(2)	6(1)	4(1)	...	...
Totals	3	3	3	4	4	28	26	26	21	20
Average	4	5	3	4	5	6	6	4	4	4
Range	3-4	4-7	0-5	4-5	4-5	4-8	4-10	3-6	2-7	2-4

Table XL. Average number of spines on rostrum, carapace and telson in Spirontocaris spinus; Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	Males					Females				
	On rostrum			On telson		On rostrum			On telson	
	Below major	Above	Cara-pacial	Right	Left	Below major	Above	Cara-pacial	Right	Left
mm.										
3	4(2)	7(2)	4(2)	4(1)	4(1)	...	...	...	...	...
4	2(1)	6(1)	...	3(1)	4(1)	...	...	...	...	...
5	5(1)	9(1)	5(1)	4(1)	4(1)	4(3)	7(3)	4(3)	4(2)	4(2)
6	2(3)	7(3)	4(3)	4(3)	4(3)	1(1)	9(1)	4(1)	4(1)	4(1)
7	2(6)	7(6)	5(6)	4(4)	4(3)	4(3)	8(3)	6(3)	4(2)	4(2)
8	2(2)	8(2)	4(2)	4(3)	4(3)	5(5)	9(5)	5(5)	3(3)	4(3)
9	3(6)	12(8)	5(10)	4(8)	4(8)	5(12)	12(11)	6(14)	4(10)	4(10)
10	2(5)	12(5)	4(5)	5(4)	5(4)	2(2)	10(2)	4(2)	4(2)	4(2)
11	1(1)	9(2)	4(2)	5(2)	5(2)	2(9)	10(9)	5(9)	4(8)	4(8)
12	...	...	...	...	...	2(11)	9(12)	4(14)	4(11)	4(11)
13	...	...	...	...	...	4(5)	12(6)	5(5)	4(6)	4(6)
14	...	...	...	...	...	1(2)	10(2)	5(2)	3(1)	4(1)
15	...	...	...	...	...	1(2)	10(2)	4(2)	4(2)	4(2)
16	...	...	...	...	...	2(1)	8(1)	4(1)	4(1)	4(1)
Totals	27	30	31	27	27	56	57	61	49	49
Averages	2	11	4	4	4	3	10	5	4	4
Range	1-5	4-21	4-7	3-5	3-5	0-9	4-18	4-11	2-5	2-5

Table XLI. Average number of spines on rostrum, carapace and telson in Lebbeus groenlandicus; Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace length	Males					Females				
	On rostrum			On telson		On rostrum			On telson	
	Below	Above	Carapacial	Right	Left	Below	Above	Carapacial	Right	Left
mm.										
5	...	...	...	...	...	1(1)	2(1)	4(1)	6(1)	6(1)
6	...	...	...	...	...	2(1)	2(1)	4(1)	5(1)	5(1)
7	...	...	...	...	...	2(10)	2(10)	4(10)	7(10)	7(10)
8	3(1)	2(1)	4(1)	7(1)	8(1)	3(5)	2(5)	4(5)	7(4)	7(4)
9	2(4)	3(4)	4(4)	7(4)	7(4)	3(4)	3(4)	4(4)	7(4)	7(4)
10	3(19)	2(19)	4(19)	6(18)	7(18)	2(6)	2(6)	4(5)	7(6)	6(6)
11	3(8)	2(7)	4(7)	7(8)	7(8)	2(3)	3(3)	4(4)	7(3)	8(3)
12	3(19)	3(19)	4(16)	6(18)	7(18)	3(5)	3(5)	4(5)	7(5)	7(5)
13	3(4)	3(4)	4(5)	7(6)	7(6)	3(6)	3(6)	4(6)	7(5)	7(5)
14	3(4)	3(4)	4(4)	6(5)	6(5)	3(7)	3(7)	4(7)	7(7)	8(7)
15	3(7)	3(7)	4(10)	7(8)	7(8)	3(4)	2(4)	4(4)	7(4)	8(4)
16	...	...	...	...	...	4(5)	3(5)	4(6)	7(3)	8(3)
17	3(1)	2(1)	4(1)	7(1)	8(1)	2(5)	3(5)	4(5)	8(5)	7(5)
18	3(1)	3(1)	4(1)	7(1)	8(1)	3(13)	2(13)	4(13)	7(13)	7(13)
19	...	...	...	...	...	3(3)	3(3)	4(4)	7(4)	8(4)
20	...	...	...	...	...	3(4)	3(4)	4(4)	9(4)	8(4)
21	...	...	...	...	...	4(2)	4(2)	4(1)	...	...
22	...	...	...	...	...	2(2)	3(2)	4(2)	5(1)	5(1)
23	...	...	...	...	...	3(1)	5(1)	4(1)	7(1)	7(1)
Totals	68	67	68	70	70	88	87	88	81	81
Averages	3	3	4	7	7	3	3	4	7	7
Range	1-4	1-4	4	4-8	5-8	1-4	1-4	3-5	3-10	5-10

Table XLII. Average number of spines on rostrum, carapace and telson in *Lebbeus polaris*; *Calanus* Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	Males					Females				
	On rostrum			On telson		On rostrum			On telson	
	Below	Above	Carapacial	Right	Left	Below	Above	Carapacial	Right	Left
mm.										
3	...	...	...	...	...	2(4)	2(4)	4(4)	3(4)	3(4)
4	3(1)	5(1)	...	4(1)	4(1)	2(67)	2(67)	4(67)	4(66)	4(66)
5	5(2)	6(2)	4(1)	4(2)	4(2)	2(3)	1(3)	4(3)	4(3)	4(3)
6	2(3)	1(3)	3(3)	5(2)	5(2)	3(5)	3(5)	3(5)	4(3)	4(3)
7	3(7)	3(7)	4(7)	5(7)	4(7)	2(9)	2(9)	4(10)	4(11)	4(11)
8	3(10)	2(11)	3(12)	5(10)	5(10)	3(14)	1(14)	3(17)	5(14)	5(14)
9	2(15)	2(15)	3(16)	5(14)	5(14)	3(6)	2(6)	3(7)	5(8)	5(8)
10	3(14)	1(15)	1(15)	5(14)	4(15)	3(10)	2(10)	3(12)	5(12)	4(12)
11	3(21)	0(22)	1(12)	5(12)	5(12)	2(13)	1(13)	3(14)	4(14)	4(14)
12	2(10)	1(10)	1(10)	5(8)	5(8)	3(20)	1(20)	3(24)	5(20)	5(20)
13	...	...	...	...	...	3(15)	2(15)	3(18)	5(14)	5(14)
14	...	...	...	...	...	3(14)	2(14)	3(14)	5(8)	5(8)
15	...	...	...	...	...	2(8)	2(8)	3(10)	5(9)	5(9)
16	...	...	...	...	...	2(2)	2(2)	4(2)	5(1)	5(1)
Totals	83	86	76	70	70	190	190	207	187	187
Averages	3	1	2	5	5	2	2	3	4	4
Range	0-6	0-6	0-5	3-7	2-9	1-5	0-6	2-5	3-9	3-10

Table XLIII. Average number of spines on rostrum, carapace and telson in Eualus fabricii; Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	Males					Females				
	On rostrum			On telson		On rostrum			On telson	
	Below	Above	Carapacial	Right	Left	Below	Above	Carapacial	Right	Left
mm.										
3	...	...	...	...	...	...	...	...	5(1)	5(1)
4	...	...	...	...	...	2(2)	0(2)	3(2)	4(2)	4(2)
5	2(1)	0(1)	4(1)	3(1)	3(1)	...	...	...	...	...
6	2(10)	0(10)	4(10)	4(11)	5(11)	2(8)	0(8)	4(8)	5(7)	4(7)
7	2(18)	0(20)	4(21)	5(22)	5(22)	3(7)	0(7)	4(7)	4(6)	4(6)
8	3(15)	0(15)	4(16)	4(17)	4(17)	2(13)	0(13)	4(14)	4(12)	5(12)
9	3(4)	0(4)	4(5)	5(7)	4(7)	2(27)	0(27)	4(28)	4(29)	4(29)
10	...	...	...	...	...	2(28)	0(29)	4(34)	5(30)	5(30)
11	...	...	...	...	...	2(15)	0(18)	4(21)	4(19)	4(19)
12	...	...	...	...	...	2(4)	0(5)	4(7)	5(4)	5(4)
13	...	...	...	...	...	...	...	4(1)	5(1)	5(1)
14	...	...	...	...	...	...	...	3(1)	...	...
Totals	48	50	53	58	58	104	109	123	111	111
Averages	2	0	4	4	4	2	0	4	4	4
Range	1-5	0-1	0-5	3-5	3-6	1-4	0-1	3-5	2-6	2-6

Table XLIV. Average number of spines on rostrum, carapace and telson in Eualus gaimardi; Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	Males					Females				
	On rostrum			On telson		On rostrum			On telson	
	Below	Above	Carapacial	Right	Left	Below	Above	Carapacial	Right	Left
mm.										
3[a]	...	...	...	...	...	2(1)	3(1)	3(1)	...	...
4[a]	...	...	...	...	...	4(3)	4(3)	4(3)	5(3)	5(3)
5	...	...	...	...	...	...	...	...	...	...
6	3(1)	4(1)	3(4)	6(2)	6(2)	4(1)	4(1)	4(1)	4(2)	4(2)
7	4(5)	5(5)	4(6)	5(6)	5(6)	3(3)	4(3)	4(4)	5(5)	5(5)
8	3(1)	4(1)	4(2)	4(2)	5(2)	5(2)	4(2)	4(3)	4(1)	6(1)
9	...	...	3(1)	5(1)	5(1)	4(3)	3(3)	4(2)	5(3)	5(3)
10	...	...	...	...	...	4(4)	4(4)	4(7)	4(7)	4(7)
11	...	...	...	...	...	4(2)	3(2)	4(2)	5(2)	5(2)
Totals	7	7	13	11	11	19	19	23	23	23
Averages	4	5	3	5	5	4	4	4	5	5
Range	3-5	3-6	3-4	3-6	3-6	2-5	2-5	3-5	2-6	2-6

[a]Juveniles

Table XLV. Average number of spines on rostrum, carapace and telson in Eualus gaimardi belcheri; Calanus Expeditions in Ungava Bay, 1947-1950.

Carapace lengths	On rostrum Below	Above	Carapacial	On telson Right	Left	On rostrum Below	Above	Carapacial	On telson Right	Left
mm.										
8	...	...	...	...	...	4(3)	3(3)	3(3)	6(1)	5(1)
9	5(1)	4(1)	3(1)	6(1)	6(1)	...	...	...	...	...
10	3(1)	4(1)	4(2)	...	...	...	...	3(1)	...	...
11	...	...	...	...	...	5(4)	3(4)	4(4)	6(4)	5(4)
12	4(3)	3(3)	4(3)	5(3)	5(3)	4(1)	3(1)	3(1)	...	...
13	...	...	...	...	...	5(1)	3(1)	3(2)	5(1)	5(1)
14	...	...	...	...	...	4(1)	3(1)	4(3)	6(2)	6(2)
15	...	...	...	...	...	4(1)	2(1)	4(1)	5(1)	4(1)
Totals	5	5	6	4	4	11	11	15	9	9
Averages	4	3	4	5	5	4	3	4	6	5
Range	3-5	2-4	3-4	4-6	4-6	2-4	2-4	3-4	5-6	4-6