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3.

The Food of Lemon Soles in Faroese Waters.

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Introduction — Material and Treatment.

The following account of the food of lemon soles at Faroe is supplementary to a more comprehensive work on the food of the species in Scottish Waters which is in course of preparation. Most of the samples of stomachs were collected during visits of the Scottish research vessel, "Explorer", to Faroe in 1935, 1937 and 1938, but a number were obtained through the kindness of the skippers and crews of Aberdeen trawlers. The location of the samples is given in the accompanying chart which at the same time demonstrates the uneven nature of the sampling. For this reason and also because of the irregular sampling throughout the year it is proposed to continue these investigations until results more representative of the whole area are obtained.

As in the case of all lemon sole food investigations, stomachs were collected in 10 cm. groups and preserved in weak formalin. The examination of the stomachs in the laboratory included notes on the condition of the alimentary canal, identification of the types of food and measurement of the volumes of the chief food types. The identification of the principal food types was pursued to the individual species if possible, but no attempt was made to identify in detail types or sub-types of less importance, such as Amphipoda, Chitonidae, Nemertea, Gephyrea, etc. In addition, the contents of the intestines were roughly examined. Measurement of the volumes of the chief food types was carried out by means of water displacement.

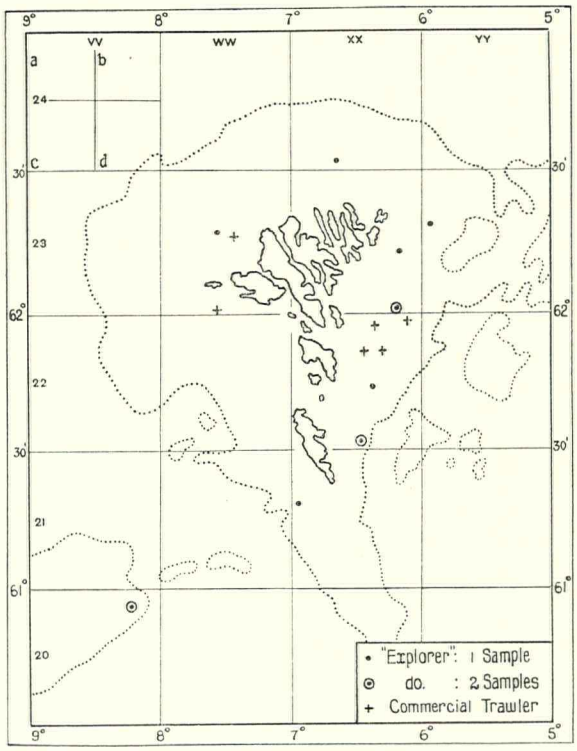

Chart I. Lemon Soles, Positions of Stomach Samples.

Condition of Stomachs and Intestines.

In the investigations on lemon soles from Scottish waters it has been found that, during the month of December, the species takes practically no food, as is shown by the empty and contracted condition of the stomachs and intestines. Feeding commences in January and proceeds at an increasing rate until the summer months when it is at its maximum. Thereafter a decline sets in which continues until December. In spite of insufficient data it seems certain that the same conditions exist on Faroese grounds, as the following table suggests:—

Table 1.

Numbers and Percentages of Empty Stomachs and Intestines.

Months	No. of Stomachs examined	No. of Empty Stomachs	%	No. of Empty Intestines	%
February	27	17	63	10	37
April, May, June ..	150	10	7	1	1
July, August.....	47	3	6	—	—
October, November	27	12	44	6	22
December.....	7	7	100	7	100

Table 2.

Frequencies and Percentages of Chief Food Types.

Size cm.	No. Stomachs	No. with Recognisable Food	P	C	M	E	L	N	G	S	F	Z	A
11—20	21	21	20	10	8	3	3	1	1	1	—	—	—
		%...	*95*	*48*	*38*	*14*	*14*	*5*	*5*	*5*	—	—	—
21—30	74	60	54	37	38	15	10	5	2	—	2	—	—
		%...	*90*	*62*	*63*	*25*	*17*	*8*	*3*	—	*3*	—	—
31—40	148	135	111	92	83	36	28	11	—	2	—	4	3
		%...	*82*	*68*	*61*	*26*	*21*	*8*	—	*1*	—	*3*	*2*
41—50	15	15	8	3	11	—	—	—	—	—	—	1	—
		%...	*53*	*20*	*73*	—	—	—	—	—	—	*7*	—

Key:— P. *Polychaeta* C. *Crustacea* M. *Mollusca* E. *Echinoderma* L. *Coelentera* N. *Nemertea* G. *Gephyrea* S. *Ascidiae* F. *Pisces* Z. *Polyzoa* A. *Algae*

Identification of Food.

(a) Change in Type of Food with Growth.

The results of the identification of the food have been surveyed in the first instance to demonstrate changes in the diet of the fish with growth (Table 2), and secondly, to show changes from one locality to another (Appendix A). Throughout this paper the frequency-percentages are calculated from the numbers of stomachs containing recognisable food. Owing to the small number of stomachs in some samples, the detailed account of the food in Appendix A is carried out without regard to the size-groups.

Not included in Table 2 are four small lemon soles of 9 to 10 cm. which were caught in 1929 and preserved for other purposes. *Polychaeta*, represented by *Serpulidae* (in 3) and *Terebellidae* (in 2), were found in three of these fish, while small pieces of *Coelentera* and *Crustacea* were present in one each.

Reference to Table 2 shows that no change in the actual types of food eaten is evident with growth but gradual changes take place in their frequencies. Regarding the area as a whole, *Polychaeta* form the bulk of the food for all size groups up to 40 cm., although the frequency of their occurrence in the stomachs gradually diminishes with increased size. Beyond 40 cm. data are meagre but the indications are that *Mollusca* surplant the *Polychaeta* as the most favoured food. Within the 11—20 cm. group preference is shown for smaller *Polychaeta* such as the *Serpulidae*, while in the 21—30 cm. and 31—40 cm. groups larger forms like the *Terebellidae* are more readily eaten.

Next in importance are the *Crustacea* and *Mollusca*. In both cases the frequencies show that more interest is shown in these forms of food by the larger fish. Small forms of the *Crustacea* such as *Amphipoda* are eaten more frequently by the 11—20 cm. group, while interest turns with growth to the *Decapoda*. In the 41—50 cm. group the Molluscan food consists almost entirely of Mussels, while smaller fish show preference for Chitons and other small *Gastropoda*. *Echinoderma*, represented chiefly by *Ophiuroidea*, are eaten with greater frequency by the 21—30 cm. and 31—40 cm. groups. The *Coelentera*, in the form of *Hydroidea*, resemble the *Echinoderma* in the frequency figures. Other types such as the *Nemertea*, *Gephyrea*, *Ascidiae*, *Polyzoa*, *Algae* and *Pisces* are of negligible importance. Out of 258 stomachs examined only two individuals contained fish — one the remains of a *Gobius* on Faroe Bank, the other a larval fish on the Nolsö grounds.

(b) Seasonal Change in Type of Food.

Although the data are rather scanty for drawing conclusions, there appears to be little or no change in the type of food consumed throughout the year. From Appendix A it is clear that, at the position 62°00′ N.—6°12′ W., samples taken in May and July are almost identical as regards food. In Area XX22b, sampled on five occasions from February to October, similarity exists between the food consumed, although in this case the samples are from slightly different positions. Lastly, samples procured in May and July from 61°32′ N.—6°28′ W., are also in close agreement.

(c) Local Variations in the Food.

From Appendix A the occurrence of local variations in the food of lemon soles may be noted both as regards the animals consumed and the percentages of the various types. Sedentary *Polychaeta* are represented in the food list by eight families of which the *Terebellidae* are the most frequent in all samples. The *Amphictenidae*, represented by one species, *Ampharete Grubei*, are very common at one position east of Nolsö but are scarce elsewhere. In the errant class of *Polychaeta*, the *Eunicidae* are predominant in most samples and are followed in importance by the *Aphroditidae* and *Phyllodocidae*, while three other families are less common.

Table 3.

Volumes of Food Types in Stomachs in c.c.

Size cm.	No. of Stomachs	Total Volume c.c.	Polyc.	Crust.	Moll.	Echin.	Coel.	etc.
11—20	21	8·50	6·06	0·55	0·27	0·02	0·22	0·20
		%	*71*	*6*	*3*	+	*3*	*2*
21—30	71	44·95	26·11	7·41	6·86	0·63	0·14	0·81
		%	*58*	*16*	*15*	*1*	+	*2*
31—40	144	199·82	104·98	35·04	37·84	9·86	1·53	2·70
		%	*53*	*18*	*19*	*5*	+	*1*
41—50	15	123·00	2·20	0·30	120·50	—	—	—
		%	*2*	+	*97*	—	—	—

Among the *Crustacea* the *Decapoda* are by far the most important group. On Nolsö grounds the outstanding feature of the food is the high percentage of *Decapoda* such as *Eupagurus*, *Galathea* and *Hyas*. Further south in XX22d and XX21a this group is less frequent, while along the north coast it is completely absent from the stomachs.

In some localities in Scottish waters the *Amphipoda* form an appreciable part of the food of lemon soles and Hørring (3) records their abundance in some stomachs which he examined at Faroe. In the present investigations, however, *Amphipoda*, when present in the stomachs, are represented by one or two specimens only so that volumetrically they are of negligible importance. Pieces of *Cirripedia*, probably *Balanus*, and *Isopoda* are recorded occasionally.

In the Molluscan type of food *Gastropoda*, in the form of Chitons and small *Patellidae* and *Fissurellidae*, are more frequent than *Lamellibranchiata* although larger forms of the latter constitute an important item in the diet of the larger lemon soles, especially on the Nolsö grounds.

On Faroe Bank the food is characterised by the relative scarcity of all the common food types. Further sampling in this area is desirable since preliminary work on the growth of lemon soles reveals a poorer rate of growth on Faroe Bank than on grounds around the Faroes.

Volumetric Measurements of Food Types.

The combined results of volumetric measurements are given in Table 3.

The percentages of the total volumes of food for each size-group tend to follow the course of the frequency-percentages in Table 2, while, at the same time, emphasising the greater importance of the three types — *Polychaeta*, *Crustacea* and *Mollusca*. *Echinoderma* and *Coelentera* are thus shown to occupy a position of less importance than is indicated by their frequencies.

The identification of so many individual species has prompted the drawing up of Appendix B giving the frequencies of their occurrence along with the approximate numbers of each. The latter is often rendered difficult by the fragmentary nature of the food in the stomachs but an attempt is made by counting the heads or head regions. In some regions, for example west of Myling Head, a large proportion of the stomach contents consists of Terebellid tentacles, thus making the enumeration of the animals preyed upon impossible.

The following works have been consulted:—

1. Bell, J. A History of British Stalk-Eyed Crustacea.
2. Fauvel, P. Faune de France — Polychètes.
3. Hørring, R. Fiskeri-Beretning for 1900—1901, p. 203—204.
4. Jeffreys, J. G. British Conchology.
5. Mortensen, Th. Handbook of the Echinoderms of the British Isles.
6. Spärck, R. Preliminary Survey of the Results of Quantitative Bottom Investigations in Iceland and Faroe Waters, 1926—1927. Rapp. et Proc.-Verb. Vol. LVII, 1929.
7. Stephensen, K. The Zoology of the Faroes — Marine Crustacea.

Appendix A. Frequencies and Percentages of Detailed

Latitude	60°54′N.	60°54′N.			61°17′N.		61°32′N.	61°32′N.			61°45′N.	61°57′N*
Longitude	8°16′W.	8°16′W.			6°58′W.		6°28′W.	6°28′W.			6°26′W.	6°07′W
Area	VV20b	VV20b			XX21a		XX22d	XX22d			XX22b	XX22b
Depths (metres)	133	120	Totals		144		132	106	Totals		73	92-118
Date	6:6:35	3:7:38	%		28:5:37	%	27:5:37	3:7:38	%		26:5:37	6/12:2:3
No. of stomachs	6	9	15		15		27	4	31		2	27
No. with recognisable food	6	8	14		15		27	4	31		2	16
POLYCHAETA	5	5	10	*71*	14	*93*	26	3	29	*94*	2	12
Sabellidae	1	..	1	*7*	3	*20*	2	..	2	*6*	..	..
Serpulidae	..	1	1	*7*	..	..	1	..	1	*3*	2	..
Terebellidae	1	1	2	*14*	12	*80*	23	2	25	*81*	1	4
Oweniidae	1	..	1	*7*	..	..	1	..	1	*3*	..	..
Ampharetidae	..	..	..	..	1	*7*	4	..	4	*13*	..	..
Maldanidae	..	..	..	..	..	..	1	..	1	*3*	..	..
Amphictenidae	—	—	—	—	—	—	—	—	—	—	—	1
Chloraemidae	..	..	..	..	..	..	..	..	..	..	..	..
Aphroditidae	..	..	..	..	2	*13*	10	2	12	*39*	1	3
Phyllodocidae	..	..	..	..	3	*20*	4	1	5	*16*	..	..
Eunicidae	1	..	1	*7*	2	*13*	20	1	21	*68*	1	1
Nereidae	—	—	—	—	2	*13*	5	—	5	*16*	—	—
Syllidae	..	..	..	..	..	..	1	..	1	*3*	1	..
Nephthydidae	..	..	..	..	..	..	..	..	..	..	..	..
CRUSTACEA	2	4	6	*43*	7	*47*	13	4	17	*55*	1	10
Amphipoda	..	2	2	*14*	5	*33*	8	2	10	*32*	1	1
Decapoda	—	2	2	*14*	3	*20*	6	4	10	*32*	1	9
Eupagurus	..	..	..	..	1	*7*	3	2	5	*16*	1	3
Galathea	..	..	..	..	..	..	1	3	4	*13*	..	2
Hyas	..	..	..	..	..	..	1	1	2	*6*	..	1
Isopoda	..	..	..	..	..	..	1	..	1	*3*	..	..
Cirripedia	—	—	—	—	1	*7*	1	1	2	*6*	—	1
MOLLUSCA	2	6	8	*57*	10	*67*	16	4	20	*65*	..	7
Gastropoda	..	3	3	*21*	9	*60*	14	3	17	*55*	..	3
Nudibranchiata	..	1	1	*7*	..	..	..	1	1	*3*	..	2
Chitonidae	..	1	1	*7*	8	*53*	10	1	11	*35*	..	..
Lamellibranchiata	1	2	3	*21*	1	*7*	2	3	5	*16*	—	3
ECHINODERMA	1	2	3	*21*	4	*27*	16	3	19	*61*	..	2
Ophiuroidea	1	2	3	*21*	2	*13*	11	3	14	*45*	..	2
Echinoidea	..	..	..	..	..	..	3	..	3	*10*	..	..
Crinoidea	..	..	..	..	..	..	2	..	2	*6*	..	..
Holothurioidea	—	—	—	—	2	*13*	1	—	1	*3*	—	—
COELENTERA	2	4	6	*43*	2	*13*	4	2	6	*19*	..	3
Anthozoa	..	2	2	*14*	..	..	..	..	..	..	..	..
Hydroidea	2	2	4	*29*	2	*13*	4	2	6	*19*	..	3
NEMERTEA	..	1	1	*7*	..	..	4	2	6	*19*	..	..
GEPHYREA	..	..	..	..	..	..	2	..	2	*6*	..	..
ASCIDIAE	..	1	1	*7*	..	..	..	..	..	..	..	..
POLYZOA	..	..	..	..	1	*7*	1	1	2	*6*	..	2
PISCES	..	1	1	*7*	..	..	..	..	..	..	..	..
ALGAE	..	..	..	..	1	*7*	1	1	2	*6*	..	..

Food Types. (* Trawler Samples.)

*61°56′N. 6°25′W. XX22b	*61°52′N. 6°30′W. XX22b	*61°52′N. 6°23′W. XX22b	Totals		62°00′N. 6°12′W. XX23d	62°12′N. 6°11′W. XX23d	62°00′N. 6°12′W. XX23d	Totals		62°20′N. 5°55′W. YY23a		62°34′N. 6°37′W. XX24c		*62°15′N. 7°27′W. WW23b		62°16°N. 7°32′W. WW23a	
					91	105	110			106		145				110	
29:4:38	31:8:38	29:10:38	%		22:5:37	25:5:37	5:7:38	%		4:7:38	%	25:5:37	%	1/5:11:38	%	26:5:37	%
8	12	14	63		79	1	17	97		5		5		13		7	
8	12	10	48		78	1	17	96		5		5		10		7	
2	11	6	33	*69*	66	1	13	80	*83*	5	*100*	5	*100*	10	*100*	7	*100*
..	..	1	1	*2*	10	..	2	12	*13*	4	*80*	..	..	..	..	1	*14*
..	..	1	3	*6*	12	..	..	12	*13*	2	*40*	3	*60*	..	..	1	*14*
..	11	1	17	*35*	31	1	8	40	*42*	5	*100*	5	*100*	9	*90*	7	*100*
..	..	..	..	..	7	..	1	8	*8*	..	..	..	..	..	..	..	..
..	..	1	1	*2*	34	..	3	37	*39*	..	..	..	..	1	*10*	..	..
..	..	1	1	*2*	..	..	..	..	..	..	..	..	..	..	..	..	..
—	—	—	1	*2*	2	—	3	5	*5*	—	—	—	—	—	—	—	—
..	..	..	..	..	5	..	1	6	*6*	..	..	..	..	..	..	..	..
..	1	1	6	*13*	18	..	5	23	*24*	1	*20*	1	*20*	3	*30*	1	*14*
..	1	..	1	*2*	8	1	1	10	*10*	5	*100*	2	*40*	4	*40*	6	*86*
..	1	..	3	*6*	26	..	4	30	*31*	3	*60*	4	*80*	2	*20*	1	*14*
—	1	—	1	*2*	1	—	1	2	*2*	—	—	—	—	—	—	—	—
..	..	..	1	*2*	2	..	..	2	*2*	1	*20*	..	..	..	..	1	*14*
..	..	..	..	..	2	..	..	2	*2*	..	..	..	..	..	..	..	..
1	5	5	22	*46*	67	..	14	81	*84*	4	*80*	..	..	4	*40*	1	*14*
1	2	1	6	*13*	12	..	3	15	*16*	3	*60*	..	..	4	*40*	1	*14*
—	3	5	18	*38*	60	—	11	71	*74*	3	*60*	—	—	—	—	—	—
..	2	..	6	*13*	12	..	2	14	*15*	..	..	..	..	..	..	..	..
..	..	3	5	*10*	21	..	3	24	*25*	..	..	..	..	..	..	..	..
..	..	2	3	*6*	9	..	3	12	*13*	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
—	—	—	1	*2*	11	—	1	12	*13*	—	—	—	—	—	—	—	—
8	12	7	34	*71*	44	1	12	57	*59*	4	*80*	..	..	1	*10*	6	*86*
1	3	2	9	*19*	39	1	10	50	*52*	1	*20*	..	..	1	*10*	6	*86*
..	2	..	4	*8*	1	..	5	6	*6*	..	..	..	..	1	*10*	1	*14*
1	..	1	2	*4*	26	1	7	34	*35*	1	*20*	..	..	..	..	6	*86*
8	11	6	28	*58*	10	—	6	16	*17*	4	*80*	—	—	—	—	5	*71*
..	..	..	2	*4*	14	..	9	23	*24*	..	..	..	..	..	..	3	*43*
..	..	..	2	*4*	11	..	4	15	*16*	..	..	..	..	..	..	2	*29*
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
—	—	—	—	—	5	—	7	12	*13*	—	—	—	—	—	—	1	*14*
..	..	2	5	*10*	18	..	2	20	*21*	2	*40*	..	..	..	..	..	..
..	..	..	..	..	2	..	1	3	*3*	2	*40*	..	..	..	..	..	..
..	..	2	5	*10*	16	..	1	17	*18*	..	..	..	..	..	..	..	..
..	1	..	1	*2*	5	..	2	7	*7*	..	..	..	..	1	*10*	1	*14*
..	..	..	..	..	..	..	..	..	..	1	*20*	..	..	..	..	..	..
..	..	..	..	..	2	..	..	2	*2*	..	..	..	..	..	..	..	..
..	..	..	2	*4*	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	1	..	..	1	*1*	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Appendix B.

Frequencies (F) and Numbers (N) of Species

Latitude	60°54′N.		61°17′N.		61°32′N.		61°45′N.		61°57′N.		61°56′N.	
Longitude	8°16′W.		6°58′W.		6°28′W.		6°26′W.		6°07′W.		6°25′W.	
Area	VV20b		XX21a		XX22d		XX22b		XX22b		XX22b	
Depth (metres)	133-120		144		132-106		73		92-118		—	
No. of stomachs with recognisable food	14		15		31		2		16		8	
Serpula vermicularis	..	..	..	..	..	..	..	..	..	..	..	..
Hydroides norvegica	..	..	..	..	1	1	2	2	..	..	..	..
Pomatoceros triqueter	..	..	..	..	..	..	..	..	..	..	..	..
Sabella pavonina	—	—	1	2	1	1	—	—	—	—	—	—
Chone sp.	..	..	..	..	..	..	..	..	..	..	..	..
Euchone rubrocincta	..	..	..	..	..	..	..	..	..	..	..	..
Lanice conchilega	..	..	2	3	..	..	1	1	1	1	..	..
Thelepus cincinnatus	—	—	1	2	16	39	—	—	—	—	—	—
Lysilla loveni	..	..	..	..	1	1	..	..	..	..	..	..
Nicomache lumbricalis	..	..	..	..	1	2	..	..	..	..	..	..
Ampharete grubei	..	..	1	1	4	4	..	..	..	..	..	..
Pectinaria sp.	—	—	—	—	—	—	—	—	1	1	—	—
Pectinaria auricoma	..	..	..	..	..	..	..	..	..	..	..	..
Petta pusilla	..	..	..	..	..	..	..	..	..	..	..	..
Owenia fusiformis	1	1	..	..	1	1	..	..	..	..	..	..
Stylarioides sp.	—	—	—	—	—	—	—	—	—	—	—	—
Stylarioides plumosa	..	..	..	..	..	..	..	..	..	..	..	..
Lepidonotus squamatus	..	..	..	..	1	1	..	..	3	3	..	..
Lagisca extenuata	..	..	..	..	..	..	..	..	..	..	..	..
Phyllodoce sp.	—	—	1	1	—	—	—	—	—	—	—	—
Eulalia sp.	..	..	..	..	3	3	..	..	..	..	..	..
Eulalia viridis	..	..	..	..	..	..	..	..	..	..	..	..
Eunice sp.	..	..	..	..	..	..	..	..	..	..	..	..
Eunice pennata	—	—	—	—	9	13	—	—	1	1	—	—
Onuphis sp.	..	..	..	..	..	..	..	..	..	..	..	..
Onuphis conchylega	..	..	2	3	15	107	1	1	..	..	..	..
Hyalinoecia tubicola	1	1	..	..	..	..	..	..	..	..	..	..
Nereis sp.	—	—	2	3	3	4	—	—	—	—	—	—
Nereis zonata	..	..	..	..	..	..	..	..	..	..	..	..
Syllis sp.	..	..	..	..	1	2	..	..	..	..	..	..
Nephthys sp.	..	..	..	..	..	..	..	..	..	..	..	..
Galathea sp.	—	—	—	—	4	19	—	—	2	2	—	—
Galathea nexa	..	..	..	..	2	3	..	..	1	1	..	..
Eupagurus sp.	..	..	1	1	5	8	1	1	3	3	..	..
Eupagurus bernhardus	..	..	..	..	..	..	..	..	1	1	..	..
Hyas sp.	—	—	—	—	2	3	—	—	1	1	—	—
Hyas coarctatus	..	..	..	..	..	..	..	..	..	..	..	..
Pandalus sp.	..	..	..	..	..	..	..	..	..	..	..	..
Tectura sp.	..	..	..	..	2	3	..	..	..	..	..	..
Tectura fulva	—	—	—	—	2	2	—	—	—	—	—	—
Emarginula fissura	..	..	..	..	..	..	..	..	..	..	..	..
Puncturella noachina	..	..	1	4	4	5	..	..	..	..	..	..
Velutina laevigata	..	..	..	..	..	..	..	..	1	1	..	..
Trochus sp.	—	—	—	—	—	—	—	—	—	—	—	—
Trochus magus	..	..	..	..	..	..	..	..	..	..	..	..
Pecten sp. (young)	..	..	..	..	1	1	..	..	..	..	..	..
Mytilus sp.	..	..	..	..	1	1	..	..	1	1	8	?
Cardium fasciatum	—	—	1	2	2	9	—	—	—	—	—	—
Amphipholis squamata	..	..	..	..	1	1	..	..	..	..	..	..
Ophiopholis aculeata	..	..	1	1	5	6	..	..	2	3	..	..
Ophiura albida	1	2	1	1	5	6	..	..	..	..	..	..
Ophiura affinis	—	—	—	—	1	1	—	—	—	—	—	—
Echinocyamus pusillus	..	..	..	..	2	2	..	..	..	..	..	..
Gobius sp.	1	1	..	..	..	..	..	..	..	..	..	..
	F	N	F	N	F	N	F	N	F	N	F	N

and Genera Recognised in Stomach Contents.

61°52′N. 6°30′W. XX22b —		61°52′N. 6°23′W. XX22b —		62°00′N. 6°12′W. XX23d 91-110		62°12′N. 6°11′W. XX23d 105		62°20′N. 5°55′W. YY23a 106		62°34′N. 6°37′W. XX24c 145		62°15′N. 7°27′W. WW23b —		62°16′N. 7°32′W. WW23a 110	
12		10		95		1		5		5		10		7	
..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..
..	..	1	1	8	10	..	..	2	11	2	2	..	..	1	1
..	..	..	..	7	7	..	..	1	1	..	..	..	..	..	..
—	—	—	—	6	7	—	—	—	—	—	—	—	—	—	—
..	..	..	..	..	..	..	..	2	2	..	..	..	..	..	..
..	..	..	..	..	..	..	..	1	1	..	..	..	..	1	1
7	23	..	..	2	3	1	1	4	5	2	2	4	9	4	10
5	12	—	—	14	30	—	—	—	—	—	—	5	7	1	1
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	35	122	..	..	..	..	..	..	1	1	..	..
—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	—
..	..	..	..	3	3	..	..	..	..	..	..	..	..	..	..
..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..
..	..	..	..	8	8	..	..	..	..	..	..	..	..	..	..
—	—	—	—	2	2	—	—	—	—	—	—	—	—	—	—
..	..	..	..	3	3	..	..	..	..	..	..	..	..	..	..
..	..	1	1	10	10	..	..	..	..	..	..	..	..	..	..
..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
..	..	..	..	2	2	..	..	..	..	..	..	3	4	1	1
..	..	..	..	..	..	..	..	4	4	..	..	..	..	3	5
1	1	..	..	1	1	..	..	..	..	..	..	..	..	..	..
—	—	—	—	4	4	—	—	—	—	—	—	2	5	1	1
..	..	..	..	5	5	..	..	..	..	..	..	..	..	..	..
..	..	..	..	22	83	..	..	3	12	4	9	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	—
1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	1	1	..	..	1	1	..	..	..	..	..	..
..	..	..	..	2	2	..	..	..	..	..	..	..	..	..	..
—	—	3	8	24	58	—	—	—	—	—	—	—	—	—	—
..	..	..	..	4	9	..	..	..	..	..	..	..	..	..	..
2	2	..	..	14	19	..	..	..	..	..	..	..	..	..	..
..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..
—	—	2	2	12	12	—	—	—	—	—	—	—	—	—	—
..	..	..	..	2	3	..	..	..	..	..	..	..	..	..	..
..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..
..	..	..	..	6	12	..	..	..	..	..	..	..	..	..	..
—	—	—	—	5	6	—	—	—	—	—	—	—	—	—	—
..	..	..	..	7	12	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	4	4	..	..	..	..	..	..	..	..	..	..
1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1	1	..	..	4	19	..	..	..	..	..	..	..	..	..	..
6	?	2	2	..	..	..	..	..	..	..	..	..	..	..	..
—	—	1	1	1	3	—	—	—	—	—	—	—	—	—	—
..	..	..	..	3	3	..	..	..	..	..	..	..	..	1	1
..	..	..	..	5	5	..	..	..	..	..	..	..	..	..	..
..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
F	N	F	N	F	N	F	N	F	N	F	N	F	N	F	N