

Job Report

Henry Compton
Marine Biologist

Project No.: MS-R-6 Date: October 12, 1965
Project Name: A Study of Texas Shrimp Populations
Period Covered: January 1, 1964 to December 31, 1964 Job No.: 9

A Study of the Post-larval Penaeid Shrimp Entering Texas Bays from the Gulf of Mexico

Abstract: Post-larval penaeids, presumably brown shrimp, Penaeus aztecus, were first caught in the Port Aransas Channel on February 17 and were present in varying abundance in samples both in this channel and in the Port Mansfield and Port Isabel Channels through the end of April. They were most abundant in the Port Aransas Channel samples of March 6 and 31, and in the Port Mansfield and Port Isabel Channel samples of April 11 and 12.

Post-larval penaeids, probably white shrimp, P. setiferus, and possibly pink shrimp, P. duorarum, were first taken in the Port Aransas Channel sample of June 4 and were caught regularly here and in the southern channels through the latter part of September, with sporadic appearances throughout the rest of the year.

Associated planktonic organisms taken in abundance were Mysids, Acetes sp., and Lucifer sp..

Objectives: To determine the seasonal abundance and size of post-larval commercial shrimp species entering bay nursery grounds from the Gulf of Mexico spawning grounds through the Port Aransas Ship Channel and the Port Mansfield and Port Isabel Ship Channels. To record and evaluate associated organisms sampled and hydrographic factors at time of sampling.

Procedures: Weekly sampling stations were established in the Aransas Ship Channel and monthly ones in both the Port Mansfield and Port Isabel Ship Channels.

A one-meter diameter hoop net of millimeter square mesh netting with a mouth of 0.6640 square meters and a flow meter mounted in the center of the mouth was used to sample the near-bottom, mid-depth, and surface levels of the channels, for two minutes at each level. Fishing depths were determined by adjusting cable lengths. The flow meter, previously calibrated, was figured on a volume of 0.09 cubic meters strained per revolution. An average six-minute sample of 328.70 cubic meters of water strained was derived from 54 samples.

A beam trawl with a mouth of 0.2038 square meters and a bag of millimeter square mesh netting protected by canvas was used for six-minute bottom channel samples. The beam trawl was pulled in conjunction with the hoop net and, since the beam trawl had no flowmeter attached, the revolution figure for the hoop net was applied. An average six-minute sample of 99.77 cubic meters of water strained was derived from 45 samples.

Temperature and salinity data were obtained at time of sampling.

Findings and

Discussion: Post-larval penaeids 12 mm long were first caught on February 17 at Port Aransas. There were 175 in the hoop net sample, or 45.42 shrimp per 100 cubic meters of water strained. Throughout the end of April, post-larvae measuring from 9 to 18 mm were obtained from all three channels, the catch being as high as 470 in the hoop net sample of March 6 in Aransas Channel and 1300 in the hoop net sample of April 12 in Port Mansfield Channel. These were assumed to be post-larvae of brown shrimp, Penaeus aztecus.

Post-larvae assumed to be white shrimp, P. setiferus, with some pink shrimp, P. duorarum, were caught in the hoop net sample of June 4 in Aransas Channel. This sample produced 230 shrimp (7-10 mm long), or 59.71 shrimp per 100 cubic meters of water strained. Shrimp were taken in all samples with some regularity through September and a few were caught as late as December.

In 1964 post-larvae were more abundant in the samples than in 1963; however, this was probably due to improved sampling techniques.

In winter months it was difficult to find incoming tides for sampling. All samples were made with the current and during the spring an effort was made to sample incoming tides. A few night/day samples were made, but no appreciable effect was observed. This requires further investigation.

Table 1 contains a summation of the samples.

Figure 1 is a composit graph of the monthly abundance of post-larvae and principal associated organisms. Lucifer sp. was the most abundant planktonic animal sampled. A slight negative correlation was noted in the abundance of Lucifer/Mysids and post-larval penaeids (Figure 1).

Figures 2 through 5 are individual graphs of abundance per sample of the organisms studied.

The narrow salinity range probably had little influence on the presence of post-larvae in the channels studied. The lowest recorded temperature at which post-larvae were taken was 14.0° C., although lower temperatures occurred during this period. More work needs to be done on this aspect. Hydrography is included in Table 1.

Prepared by: Henry Compton
Marine Biologist

Al Moffett
Project Leader

Ernest G. Simmons
Regional Supervisor

Approved by:


Terance R. Leary
Coordinator

Table 1: Number of organisms per 100 cubic meters sampled

<u>DATE</u>	<u>PENAEIDS</u>	<u>MYSIDS</u>	<u>ACETES</u>	<u>LUCIFER</u>	<u>BOTTOM</u>		<u>TYPE NET</u>
					<u>TEMP.</u>	<u>SAL.</u>	
<u>Port Aransas Channel:</u>							
January							
3				.28	12.8	34.28	hoop
February							
17	45.42		8.05	.52	16.1	36.78	hoop
20	17.5		.44		14.0	35.66	hoop
28		.26	.78		11.4	35.24	hoop
March							
6	45.49	36.56	52.8		15.6	35.72	beam
6	117.09		37.37		same		hoop
11		1.69	3.38		15.7	35.07	hoop
11	42.24	14.69	7.35		same		beam
19	.99		1.98		16.7	34.3	beam
19	.91			4.56	same		hoop
19	1.6		8.27	26.69	15.4	34.72	hoop
19	.87		3.48	14.8	same		beam
20		4.02	.95		15.6	35.01	hoop
20	6.17	3.09	10.03		same		beam
25	4.68	10.69	14.02		17.9	34.8	beam
25		12.29	9.22		same		hoop
31	29.28			12.81	18.2	32.4	beam
31	114.48			14.03	same		hoop
April							
7	1.08	2.15	1.08		21.8	34.61	beam
7		2.64	.33	.33	same		hoop
<u>Port Mansfield/Port Isabel Channels:</u>							
10		13.63	2.73	11.59	19.5	34.51	beam
10			.21	.42	same		hoop
11		18.7	8.01		20.0	35.47	hoop
11			3.48		same		beam
11	92.17	63.36	6.91	13.82	21.0	35.24	beam
11	194.31				same		hoop
12	255.55	269.95	125.97	35.99	21.7	35.37	beam
12	478.29	2.94			same		hoop
<u>Port Aransas Channel:</u>							
16	5.55				20.4	34.67	beam
16	3.97			.28	same		hoop
20	5.69	66.39			23.5	34.94	beam
20		.87	.29		same		hoop
28	.67	16.68	.67	.67	21.8	35.48	hoop
28		783.38			same		beam

Table 1 Continued:

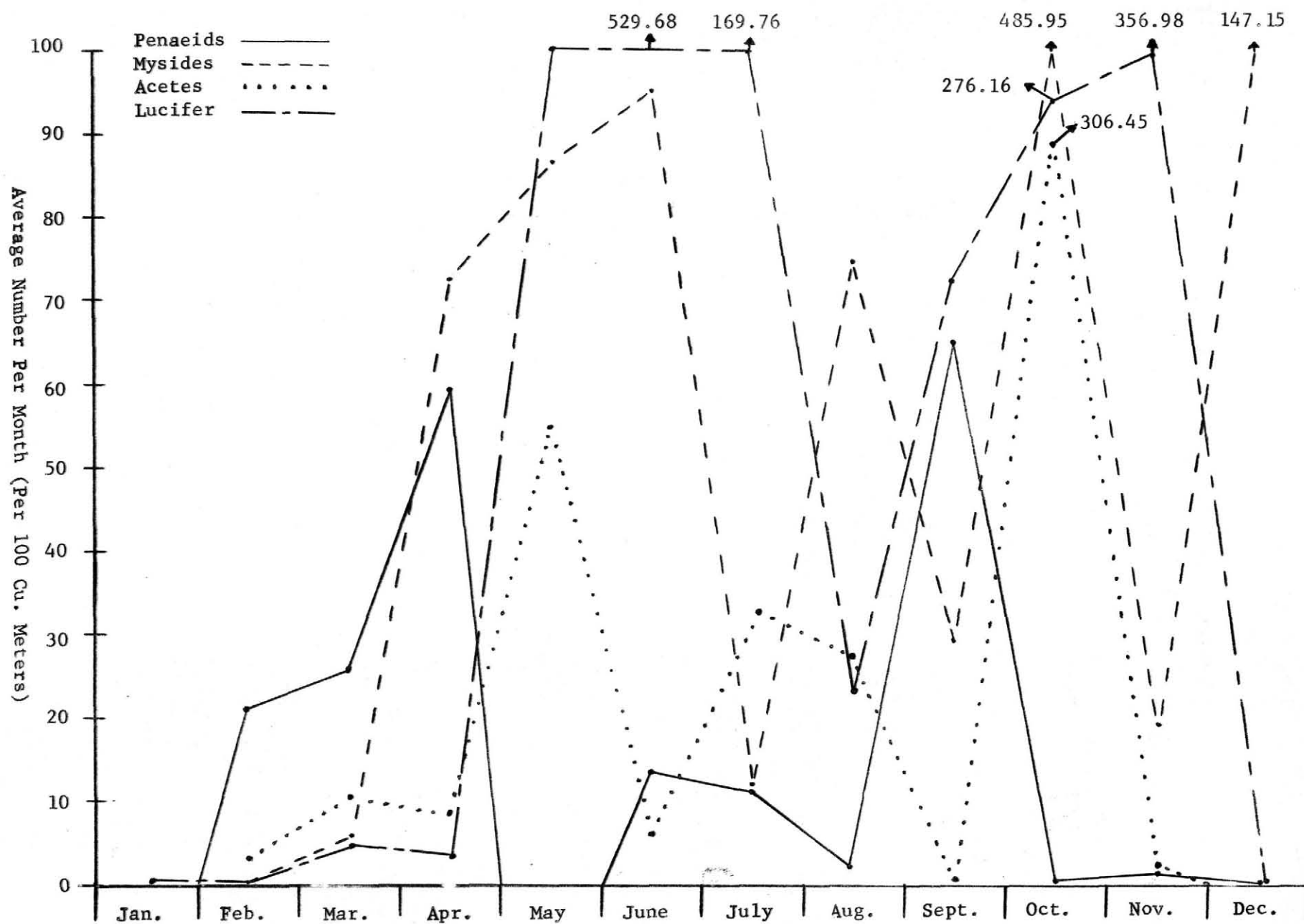
<u>DATE</u>	<u>PENAEIDS</u>	<u>MYSIDS</u>	<u>ACETES</u>	<u>LUCIFER</u>	<u>BOTTOM</u> <u>TEMP.</u>	<u>SAL.</u>	<u>TYPE NET</u>
<u>Port Aransas Channel:</u>							
May 4		5.73	3.82	1.91	21.4	36.7	beam
<u>Port Mansfield/Port Isabel Channels:</u>							
9	14.53			2.72	23.6	36.12	beam
9	139.24	222.78		33.42	same		hoop
11	14.72	44.15		29.43	27.4	35.91	hoop
<u>Port Aransas Channel:</u>							
13		283.61	59.56	425.41	26.0	35.62	beam
13		65.23		130.46	same		hoop
 June							
4	59.71			1298.02	26.7	36.17	hoop
9		12.10		1815.54	27.9	35.92	hoop
9		394.7		118.41	same		beam
16		7.61	5.07	38.05	27.8	35.99	hoop
16		82.72		165.44	same		beam
26	11.87	7.58	12.63	25.25	27.3	35.97	hoop
26	25.53	164.69	24.70	247.04	same		beam
 July							
2			.78	259.61	27.8	37.21	hoop
<u>Port Mansfield/Port Isabel Channels:</u>							
9	31.36	8.73		54.53	27.9	36.92	hoop
<u>Port Aransas Channel:</u>							
14	22.32		2.33	116.61	26.9	36.84	hoop
20	5.38	2.69		76.87	28.4	36.18	hoop
20	2.51	46.37	225.59	375.99	same		beam
31	14.15			33.29	30.1	37.43	hoop
31	4.07	24.43	2.71	271.41	same		beam
 August							
10	4.05	.37		11.79	24.8	36.91	hoop
25	2.37			59.21	30.6	36.97	hoop
26		225.05	82.14		26.9	36.94	beam
 September							
8	1.49	49.71		248.57	29.9	34.81	hoop
9	1.2	36.11	1.2	240.73	29.8	34.91	beam
<u>Port Mansfield/Port Isabel Channels:</u>							
16	391.7				27.8	34.17	beam
16	140.14				same		hoop
17	78.26	184.15			26.4	35.16	beam
17	11.29	2.54			same		hoop

Table 1 Continued:

<u>DATE</u>	<u>PENAEIDS</u>	<u>MYSIDS</u>	<u>ACETES</u>	<u>LUCIFER</u>	<u>BOTTOM</u>		<u>TYPE NET</u>
					<u>TEMP.</u>	<u>SAL.</u>	
<u>Port Aransas Channel:</u>							
September							
22		1.84		183.92	27.6	34.97	beam
22	19.74			56.92	same		hoop
28	.79	.39			26.7	34.49	hoop
28	7.63	21.61			same		beam
October							
1				3.63	25.6	34.9	hoop
1		73.94	739.43	44.43	same		beam
6		2.38	317.46	912.7	27.1	34.8	hoop
6		1149.28	2595.76		same		beam
13		7.06	17.64	1.18	26.3	34.9	beam
<u>Port Mansfield/Port Isabel Channels:</u>							
17	.39			155.95	25.1	34.2	hoop
17	5.09	4591.91	1.27	8.9	same		beam
<u>Port Aransas Channel:</u>							
22				2.42	27.1	33.4	hoop
22			1.32	1317.52	same		beam
29				21.03	26.8	33.1	hoop
29		6.86	4.57	857.24	same		beam
November							
2			6.91	1.04	25.6	34.4	hoop
2				14.65	same		beam
10	6.47			1028.81	23.6	35.7	hoop
10		76.68		383.4	same		beam
December							
<u>Port Mansfield/Port Isabel Channels:</u>							
15	.308	154.11			16.4	35.92	hoop
15		120.6			same		beam
16		131.49		.66	15.2	35.92	hoop
16		321.58			same		beam
<u>Port Aransas Channel:</u>							
30		7.98			11.5	35.7	beam

Figure 1: Post-larval penaeids --associated organisms

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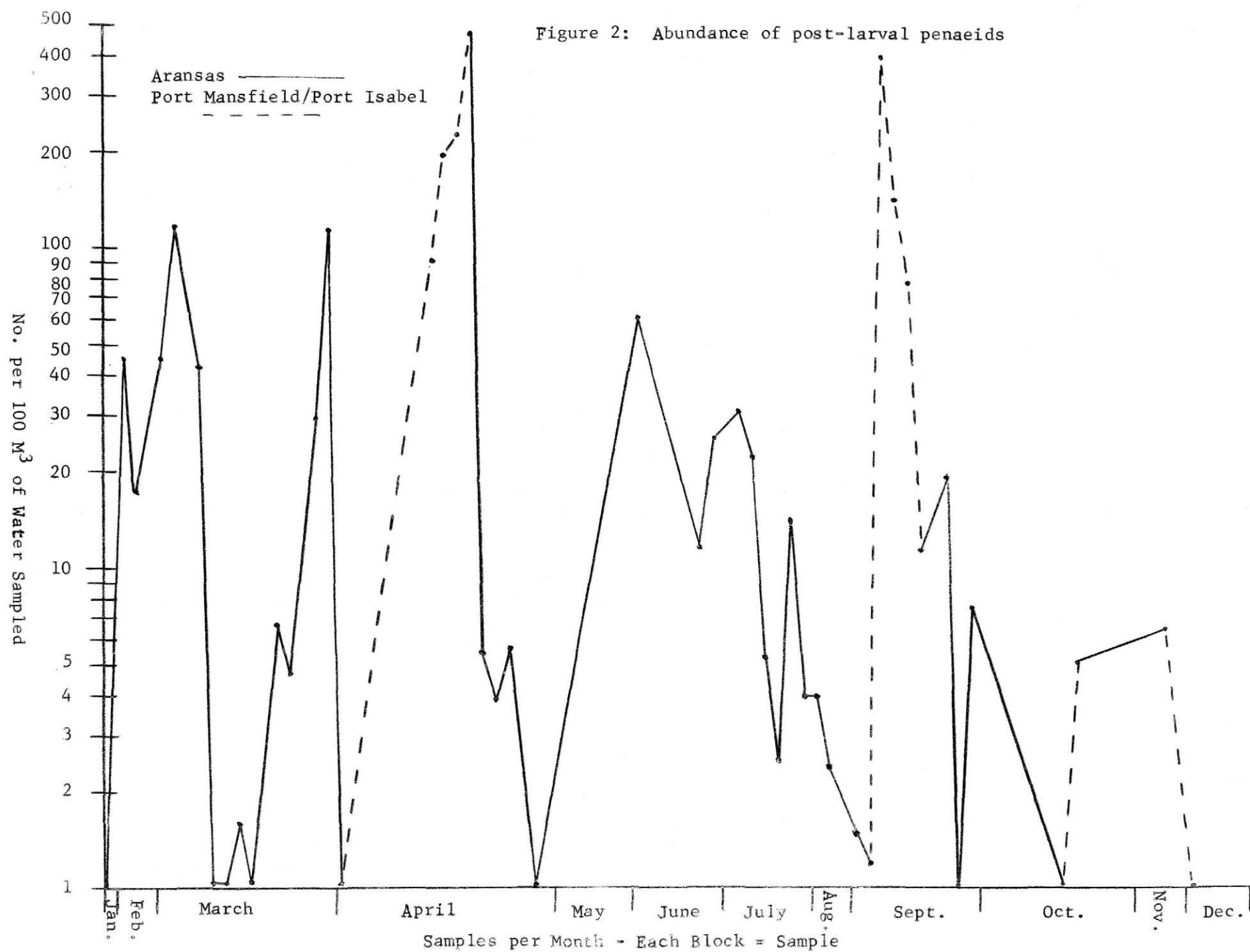


Figure 3: Abundance of Mysids

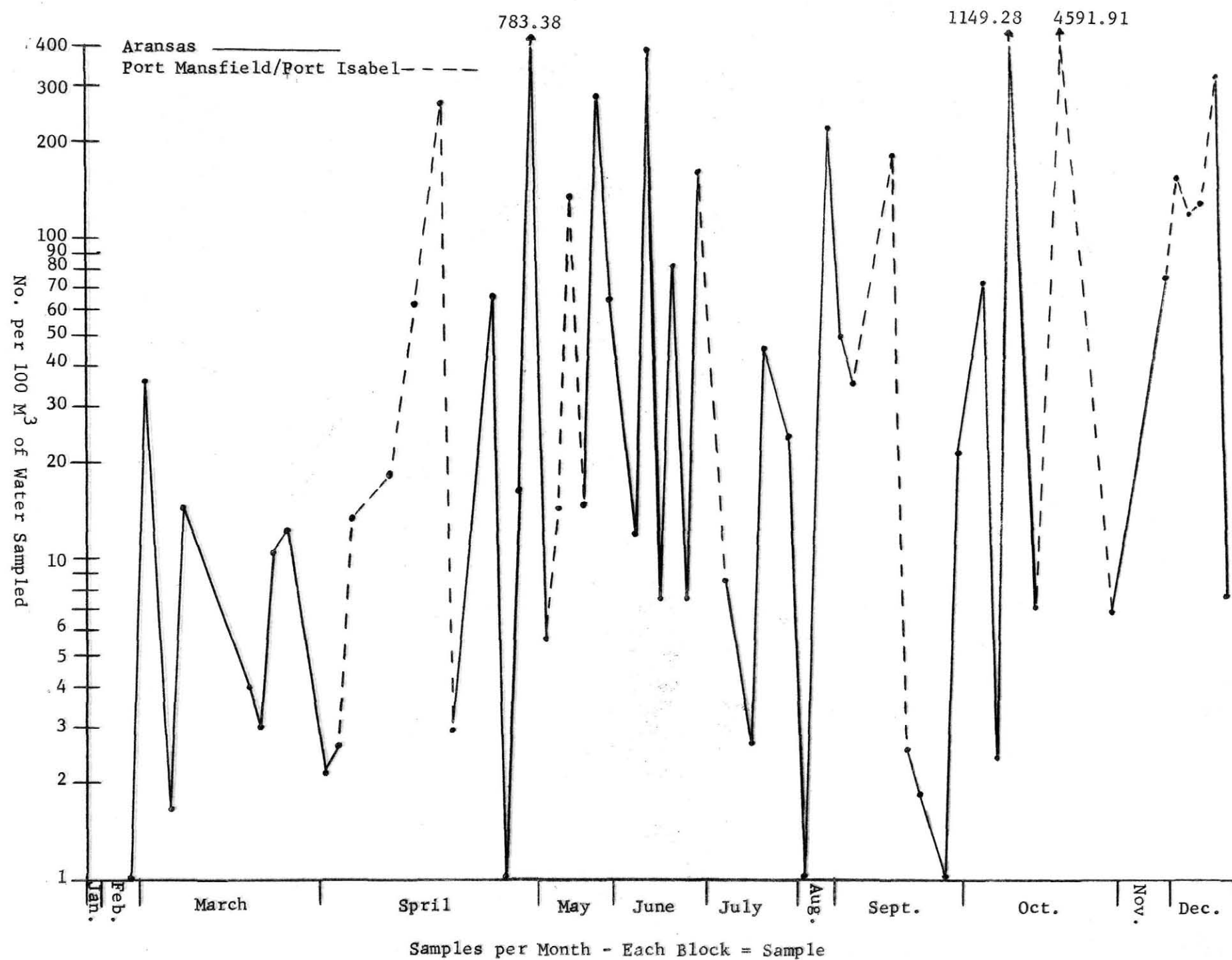


Figure 4: Abundance of Acetes sp.

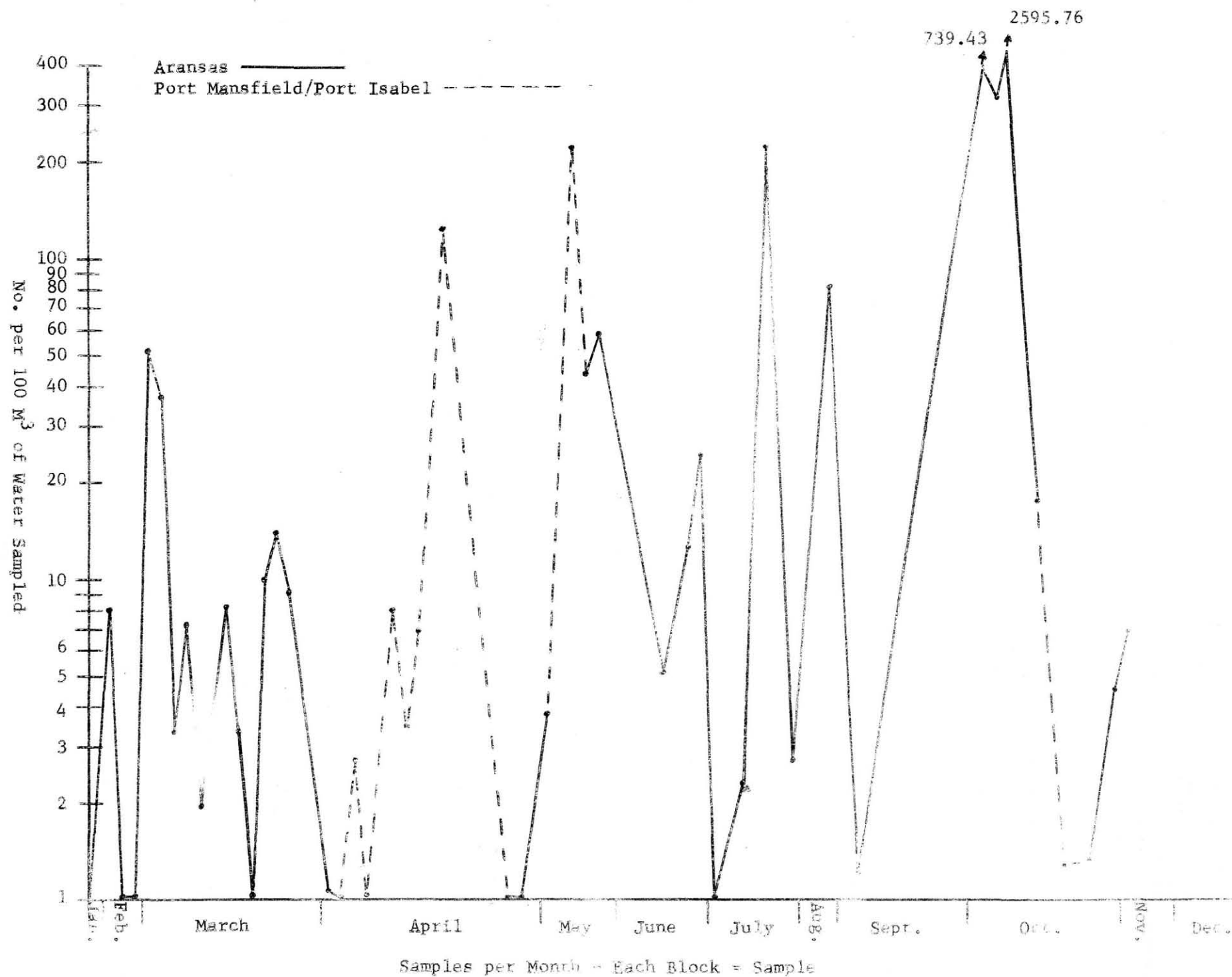


Figure 5: Abundance of Lucifer sp.

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