# ON CHAETOGNATHS AND APPENDICULARIANS COLLECTED BY MR. Z. SAGARA IN THE ARAFURA SEA IN MAY-AUGUST 1955<sup>1)</sup>

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### With a Chart and 2 Tables

By courtesy of Mr. Z. SAGARA of the Tôkai Regional Fisheries Research Laboratory, a chance was bestowed fortunately on me to examine fifty-five plankton samples collected by him in the Arafura Sea during his oceanographical observation in the period from the end of May to the begining of August 1955. These samples were hauled by a modified HENSEN's net in miniature, 10 cm in diameter of the mouth, 25 cm in the maximum diameter, 90 cm in length and stretched with Müller's gauze No. 13 (ca. 130 meshes per square inch), from the bottom to the surface at stations shown in Chart 1. The situation of stations, date and time of each sampling and some other data concerning the water of the surveyed area are given at the end of this article, where the haul distance does not mean the depth at respective stations, because the rope may very often be stretched obliquely.

Of these samples, chaetognaths and appendicularians were selected out and identified by myself, while other plankton organisms were submitted to respective specialists for their close examination. In the following, the results of my examination on the two animal groups are given in the form of tables, with some brief notes. Before going further I wish to express my hearty thanks to Mr. Z. SAGARA for his kindness.

#### I. Chaetognaths

Only nine species were found in the following proportion. Their occurrence is shown in detail in Table 1.

	Species	Number of Individuals	Percentage
1.	Sagitta enflata	440	34
2.	Sagitta bipunctata	. 1	
3.	Sagitta robusta	42	3
4.	Sagitta bedoti	161	13

1) Contributions from the Seto Marine Biological Laboratory, No. 277.

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5.	Sagitta serratodentata pacifica	6	
6.	Sagitta neglecta	46	4
7.	Sagitta regularis	9	1
8.	Pterosagitta draco	1	
9.	Krohnitta pacifica	181	14
10.	Damaged individuals or juv.	374	30
		1261	

Sag. enflata is the commonest species and is followed by Sag. bedoti and Ktta. pacifica. The absence of Sag. hexaptera and the rareness of Sag. serratodentata are considered to be due to the shallowness of the surveyed area where the water was considered, in the period of observation, as being the same as that of the surface layer of the open and deep ocean and quite free from any water masses up-welled from the depth. The universal occurrence of Sag. bedoti is a characteristic in warm coastal waters of the Indian Ocean and the Malay Archipelagoes, and that of Ktta. pacifica and the scarcity of Pterosag. draco were observed also during the survey made by Mr. S. WADA in 1938.<sup>1)</sup> Many juvenile individuals, of Ktta. pacifica were found in the present material. The water at Stations 13–18 off the southern coast of Timor was clearly much more oceanic than at other stations and samples hauled at these stations contained only a few number of chaetognaths, including no individual of Sag. bedoti.

## II. Appendicularians

The following 19 species were detected in the material, the detail of the occurrence of respective species is given in Table 2.

Species	Number of Individuals	Percentage
Oikopleura longicauda	1714	52
Oikopleura fusiformis	107	3
Oikopleura fusiformis f. cornutogastra	326	10
Oikopleura intermedia	13	,
Oikopleura dioica	68	2
Oikopleura rufescens	383	12
Oikopleura parva	1	
Oikopleura cophocerca	30	1
Oikopleura spp. (damaged)	84	3
Megalocercus huxleyi	6	
Stegosoma magnum	5	
	Oikopleura longicauda Oikopleura fusiformis Oikopleura fusiformis f. cornutogastra Oikopleura intermedia Oikopleura dioica Oikopleura rufescens Oikopleura parva Oikopleura cophocerca Oikopleura spp. (damaged) Megalocercus huxleyi Stegosoma magnum	Oikopleura longicauda1714Oikopleura fusiformis107Oikopleura fusiformis f. cornutogastra326Oikopleura intermedia13Oikopleura dioica68Oikopleura rufescens383Oikopleura parva1Oikopleura cophocerca30Oikopleura spp. (damaged)84Megalocercus huxleyi6Stegosoma magnum5

1) TOKIOKA, T. (1942): Systematic studies of the plankton organisms occurring in Iwayama Bay, Palao, III. Chaetognaths of the bay and the adjacent waters. Palao Trop. Biol. St. Stud., II (3).

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12.	Fritillaria haplostoma	32	1
13.	Fritillaria abjornseni	3	
14.	Fritillaria arafoera	1	
15.	Fritillaria formica f. digitata	4	
16.	Fritillaria pellucida	2	
17,	Fritillaria borealis f. sargassi (large individual)	5	
17a.	" " (small individual)	374	11
18.	Fritillaria spp. (damaged)	2	
19.	Tectillaria fertilis	1	
20.	Appendicularia sicula	155	5
21.	Kowalevskaia tenuis	1	
		3317	

*Oik. longicauda* is the dominant-most species of all and *Oik. fusiformis* f. cornutogastra, Oik. rufescens and Frit. borealis f. sargassi (small individual) follow it. *App. sicula* occurs commonly, but not in abundance. Oik. fusiformis, Oik. dioica and Frit. haplostoma occur less frequently and much sparsely. Oik. cophocerca was confined in the present survey to the area west to 129°14'E. The number of species was more numerous at Sts. 13–18 than at others. Rather universal occurrence of Oik. dioica, though in a small number, seems to show distinctly that the water of the surveyed area is considerably of a neritic nature.

Station Number	Situation	Date	Time	Haul Distance	Surface Temp.	Bottom Temp.	Transp- arency	Water Colour
1	11°25′S 130°04′E	May 29	12h 10′	20.5m	29.0C	28.4C	2.8m	8
2	11°25′S 130°04′E	30	12h	20.0	29.2	28.4	6.0	9
3	11°26′S 128°16′E	June 2	14h 20'	40.0	29.2	28.5	10.0	7
4	11°28′S 128°26′E	3	8h 5′	33.0	28.4	28.6	11.0	7
6	11°25′S 128°29′E	3	13h 15′	36.0	28.8	28.8	14.0	7
7	11°18′S 128°28′E	3	15h 30′	37.0	28.8	28.4	15.0	7
9	10°58′S 129°08′E	4	8h 15′	35.0	28.6	28.5	12.0	8
10	10°58′S 129°12′E	4	12h	35.0	28.6	28.6	10.0	8
11	10°56′S 129°14′E	4	16h 5'	33.0	28.5	28.4	14.0	8
13	10°21′S 126°40′E	14	7h 45′	33.0	28.2	28.3	33.0	3
14	10°39′S 126°04′E	15	9h 20′	26.0	27.9	27.9	20.0	4

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Station Number	Situation	Date	Time	Haul Distance	Surface Temp.	Bottom Temp.	Transp- arency	Water Colour
15	10°47′S 125°51′E	June 16	8h 3′	27.0m ·	27.9C	27.9C	20.0m	4
16	11°05′S 125°34′E	16	16h	25.0	28.2	28.2	25.0	3
17	11°26′S 124°39.5′E	17	8h 10′	30.0	27.8	27.9	28.0	4
18	11°32.5′S 123°35′E	18	9h 30′	30.0	28.0	28.0	30.0	4
19	9°53′S 129°15′E	26	9h	11.0	27.6	27.6	11.0	4
20	9°54.5′S 129°33.5′E	26	13h	26.0	27,3	27.2	20.0	4
22	10°41′S 129°03.5′E	27	7h 32′	40.0	27.4	27.4	11.0	4
23	10°41.5′S 129°16.5′E	27	17h	38.0	27.4	27.4	10.0	5
24	10°47′S 129°10′E	28	7h 55′	35.0	27.5	27.4	12.0	5
25	10°53′S 128°51′E	28	15h 50′	35.0	27.6	27.6	17.0	4
26	$11^{\circ}00'S$ $128^{\circ}44.5'E$	29	8h 22′	35.0	27.7	27.7	11.0	5
27	11°02.5′S 128°44′E	29	16h 45'	36.0	27.8	27.8	15.0	5
28	11°06′S 128°25′E	July 1	7h 15'	44.0	27.2	27.2	12.0	5
29	11°04′S 130°34′E	12	14h 55′	38.0	26.2	26.2	5.0	9
30	11°11.5′S 130°45′E	13	7h 55′	22.0	26.1	26.1	2.0	11
31	11°07′S 131°09′E	13	15h	23.0	26.0	26.0	1.2	11
32	11°06.5′S 131°10′E,	14	8h 10′	24.0	25.0	25.0	2.0	11
33	10°59′S 132°06.5′E	14	17h 10′	29.0	25.4	25.4	4.0	10
34	10°59′S 132°06.5′E	15	8h 30⁄	29.0	25.4	25.4	6.0	9
35	10°59.5′S 132°01′E	15	11h	35.0	25.6	25.5	10.0	8
36	10°55′S 132°06′E	16	10h 10′	37.0	25.6	25.6	5.0	9
37	10°50.5′S 132°10′E	16	12h 10′	44.0	25.7	25.7	5.0	8
38	10°54′S 132°13′E	16	13h 50′	35.0	25.8	25.7	5.0	7

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Station Number	Situation	Date	Time	Haul Distance	Surface Temp.	Bottom Temp.	Transp- arency	Water Colour
39	10°57.5′S 132°16′E	July 16	15h 15′	23.0m	25.6C	25.6C	3.5m	9
40	11°38′S 135°48′E	18	12h	35.0				8
41	11°28.5′S 135°00′E	19	11h 50′	36.0	25.1	25.1	10.0	7
42	11°29′S 135°04′E	19	15h	36.0	25.2	25.1	10.0	8
43	11°29⁄S 135°11,5⁄E	26	10h 35′	30.0	25.3	25,3	7.0	9
44	11°29′S 135°21′E	26	13h 45′	38.0	25.6	25.6	7.0	8
45	11°32⁄S 135°22.5′E	26	15h 30′	38.0	25.6	25.6		7
46	11°33′S 135°33′E	27	8h	33.0	25.3	25.3	10.0	9
47	11°29.4′S 135°48.5′E	27	11h 35′	36.0	25.5	25.5	6.0	8
48	11°22′S 135°01.5′E	27	15h 10′	36.0	25.5	25.5	8.0	8
49	11°10′S 136°19′E	28	9h 50′	35.0	25.6	25.6	11.0	8
50	11°10.3′S 136°22.5′E	28	11h 50′	31.0	25.9	25.7	9.0	9
51	11°07′S 136°27′E	28	13h 30′	31.0	26.1	25.9	4.0	9
52	11°04′S 136°29.5′E	29	8h 35⁄	32.0	25.9	25.8	4.0	9
53	11°00′S 136°29.5′E	29	9h 52′	39.0	25.9	25.9	6.0	9
54	11°06′S 135°13.5′E	29	13h 10′	38.0	25.7	25.6	11.0	7
55	11°25.5′S 135°37.5′E	30	14h 45′	35.0	25.7	25.6	7.0	9
56	11°31′S 135°14′E	31	8h 30′	28.0	25.5	25.5	7.0	9
57	11°28.5′S 135°10′E	31	10h 35′	36.0	25.5	25.5	8.0	9
58	11°31′S 133°50.5′E	Aug. 2	13h 12′	28.0	25.2	25.1	10.0	7
59	11°31′S 133°50,5′E	3	8h 30′	30.0	25.1	25.1	8.0	8

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Table 1. Detail of the occurrence of chaetognaths. F. O.....Frequency of occurrence, M.N./H.....Mean number of individuals per haul.

Station Number	1	2	3	4 6	6 7	9	10	11	13	14 1	5 16	17	18	19	20	22	23	24	25	26	27 2	28 2	93	0 31	1 32	2 33	34	35	36	37	38	39	40 4	1 4	2 43	44	45	46	47	48	49	50 5	1 5	2 53	\$ 54	55	56	57	58	59	F.O.	$\frac{M.N.}{H.}$	Contraction of the local division of the loc
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