

PLANKTON SAMPLINGS ON BOARD THE FUJI IN 1980-1983

Kentaro WATANABE,
(National Institute of Polar Research, Itabashi-ku, Tokyo 173)

Yasushi NAKAJIMA,
(Sanyo Hydrographic Survey Co., Ltd., Chuo-ku, Tokyo 103)

Yoshio INO,
(School of Education, Waseda University, Shinjuku-ku, Tokyo 160)

Hiroshi SASAKI
(Faculty of Agriculture, Tohoku University, Sendai 980)

and

Mitsuo FUKUCHI
(National Institute of Polar Research, Itabashi-ku, Tokyo 173)

During every austral summer season, plankton samplings on board the icebreaker Fuji have been carried out in the Indian sector of the Antarctic Ocean as part of the marine biological program of the Japanese Antarctic Research Expedition (JARE). Details of sampling method and the results of earlier works in 1972-1980 are published elsewhere (Fukuchi and Tanimura, 1981). Since then, three expeditions of JARE-22, -23 and -24 (1980-1983) completed their plankton samplings. The data record of these results is presented in this report.

The first and second authors (K. W. and Y. N.) carried out the plankton samplings in JARE-22 (1980/1981), the third author (Y. I.) made the JARE-23's samplings (1981/1982) and the fourth author (H. S.) made the JARE-24's samplings (1982/1983). A single Norpac standard net had been used in the earlier expeditions but a twin net was employed in JARE-23 and -24. The twin net consisted of two Norpac standard nets of two different mesh openings as listed in the following tables.

Stations of plankton samplings in 1980-1983 are shown in Fig. 1. Data on the Norpac net hauls in JARE-22, -23 and -24 are listed in Tables 1, 2 and 3, respectively. Also, data on the MTD net tows, the ORI-C net tows and the fish larva net tows in JARE-22 are summarized in Tables 4, 5 and 6, respectively.

Although measurements of biomass and primary sorting of these net samples are being undertaken, this report is prepared for the sake of making available to interested persons some preliminary data on plankton samples stored at the National Institute of Polar Research. Inquiries about details of the data record should be addressed to:

Department of Biological Data
Division of Data Collection and Processing
National Institute of Polar Research
9-10, Kaga 1-chome, Itabashi-ku, Tokyo 173.

Reference

Fukuchi, M. and Tanimura, A.: Plankton samplings on board Fuji in 1972-1980. JARE Data Rep., 60 (Marine Biology 1), 27p.

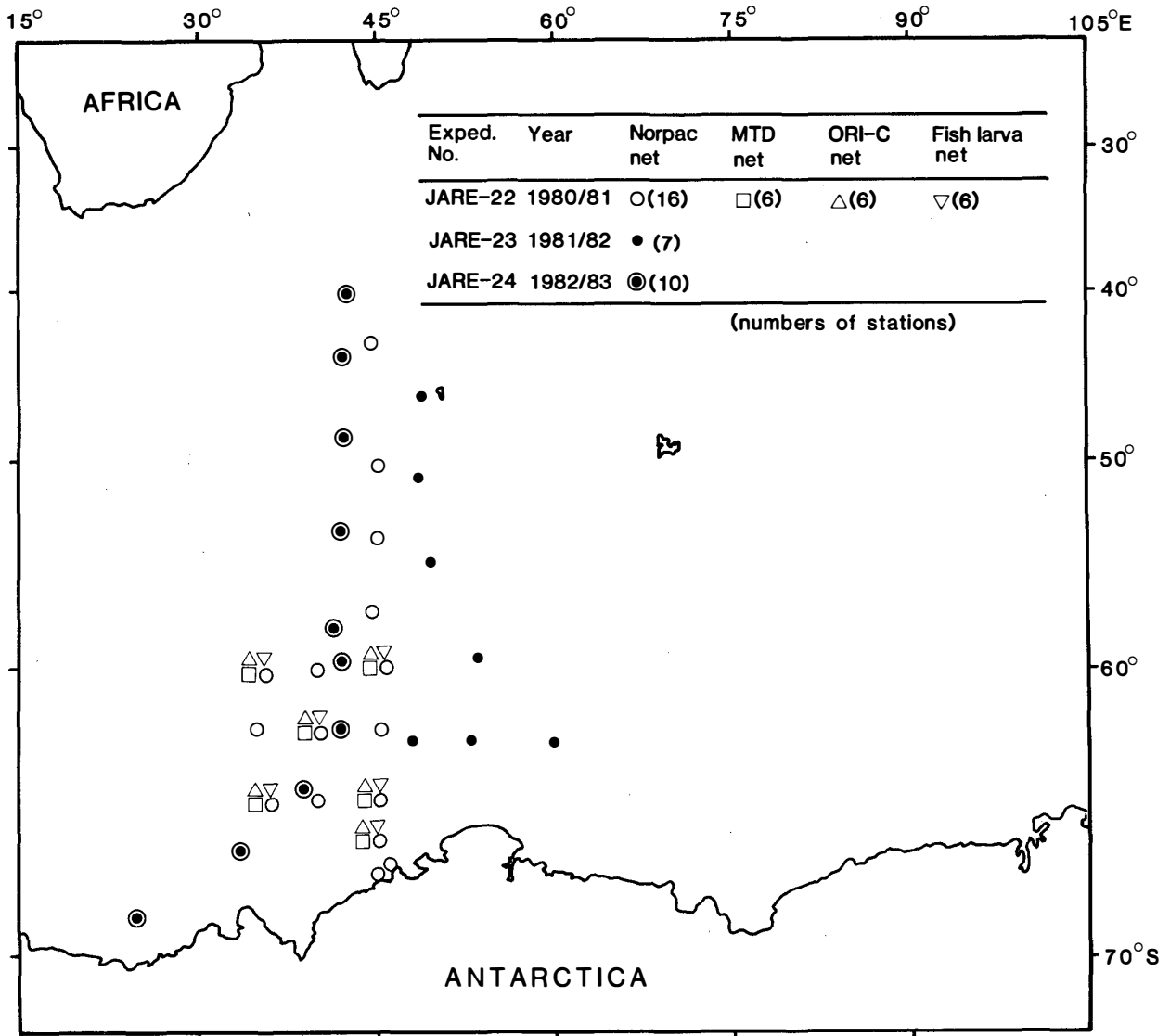


Fig.1. Stations of plankton net samplings on board the icebreaker Fuji in the Indian sector of the Antarctic Ocean in 1980-1983.

Table 1. Data on plankton collected by vertical hauls with a Norpac standard net (0.33 mm mesh openings) in the JARE-22 cruise of the Fuji to the Indian sector of the Antarctic Ocean, Feb. - Mar. 1981. Flow-meter was not used. The volume of water filtered by a vertical haul was estimated by assuming 100 % efficiency of the net. Samplings were carried out by K. Watanabe and Y. Nakajima.

Stn.No.	Position	Ship's time		Length of wire (m)	Angle of wire (°)	Estimated depth of haul (m)	RGS Flow-meter No. Revolutions	Estimated volume of water filtered (m ³)	Wet weight of sample in a haul (g)	Wet weight of sample per 1000 m ³ of water(g)	Sample No.	Unusual large organisms removed before weighing
		Date	Time									
88'	66°19'S 44°35'E	1981 Feb.9	0730	240	45	170		38.2	1.5	39.3	22N001	
90'	67°19'S 46°03'E	Feb.11	1320	180	35	147		28.6	0.1	4.5	22N002	
91	67°36'S 45°06'E	Feb.15	1745	50	0	50		8.0	0.1	15.1	22N003	
"	"	"	"	100	0	100		15.9	0.1	6.3	22N004	
"	"	"	"	150	0	150		23.9	0.2	8.0	22N005	
"	"	Feb.16	1800	50	0	50		8.0	0.2	20.1	22N006	
"	"	"	1810	100	0	100		15.9	0.2	10.1	22N007	
"	"	"	1820	150	0	150		23.9	0.2	8.0	22N008	
"	"	"	2250	50	0	50		8.0	0.1	6.3	22N009	
"	"	"	2300	100	0	100		15.9	0.6	39.0	22N010	
"	"	"	2310	150	0	150		23.9	0.2	7.1	22N011	
"	"	Feb.17	0730	50	0	50		8.0	0.2	22.6	22N012	
"	"	"	0740	100	0	100		15.9	2.4	152.2	22N013	
"	"	"	0750	150	0	150		23.9	4.8	199.5	22N014	

Table 1. Continued.

Stn.No.	Position	Ship's time		Length of wire (m)	Angle of wire (°)	Estimated depth of haul (m)	RGS Flow-meter No. Revolutions	Estimated volume of water filtered (m ³)	Wet weight of sample in a haul (g)	Wet weight of sample per 1000 m ³ of water(g)	Sample No.	Unusual large organisms removed before weighing
		Date	Time									
93	65°00'S 44°55'E	Feb. 20	0800	170	18	162	27.0	0.7 ^g	26.3	22N015		
95	65°00'S 40°08'E	Feb. 21	0758	230	45	163	36.6	0.5	14.2	22N016		
97	65°01'S 35°00'E	Feb. 22	0750	210	40	161	33.4	0.7	21.3	22N017		
99	62°28'S 35°03'E	Feb. 23	0749	175	25	159	27.8	6.7	241.5	22N018		
101	60°00'S 34°58'E	Feb. 24	0750	165	20	155	26.2	4.4	167.7	22N019		
103	60°00'S 39°59'E	Feb. 25	0750	151	6	150	24.0	9.9	413.0	22N020		
105	62°29'S 40°01'E	Feb. 26	0751	173	30	150	27.5	5.3	193.0	22N021		
107	62°31'S 45°03'E	Feb. 27	0745	173	30	150	27.5	3.1	112.7	22N022		
109	59°58'S 45°03'E	Feb. 28	0747	166	25	150	26.4	19.0	718.6	22N023		
111	57°31'S 44°59'E	Mar. 1	0755	173	30	150	27.5	20.8	756.8	22N024		
114	54°06'S 45°00'E	Mar. 2	0749	153	12	150	24.3	3.3	134.0	22N025		
117	50°13'S 45°01'E	Mar. 3	0748	200	42	149	31.8	3.0	94.3	22N026		
121	43°18'S 44°57'E	Mar. 5	0745	175	25	159	27.8	4.7	168.2	22N027		

Table 2. Data on plankton collected by vertical hauls with two Norpac standard nets (one has 0.33 mm and another has 0.025 mm mesh openings) in the JARE-23 cruise of the Fuji to the Indian sector of the Antarctic Ocean, Feb. - Mar. 1982. Flow-meter was not used. Samplings were carried out by Y. Ino.

Stn. No.	Position	Ship's time Date Time	Length of wire (m)	Angle of wire (°)	Estimated depth of haul (m)	RGS Flow-meter No. Revolutions	Estimated volume of water filtered (m ³)	Wet weight of sample in a haul (g)	Wet weight of sample per 1000 m ³ of water (g)	Mesh size of net (µm)	Sample No.	Unusual large organisms removed before weighing
1	63°02'S 48°00'E	1982 Feb.22	0815 162	18	154					330 25	23N001 23N002	
2	63°00'S 53°00'E	1982 Feb.23	0810 188	37	150					330 25	23N003 23N004	
3	63°00'S 60°06'E	1982 Feb.24	0805 179	33	150					330 25	23N005 23N006	
4	59°26'S 53°27'E	1982 Feb.27	0806 167	26	150					330 25	23N007 23N008	
5	55°17'S 49°28'E	1982 Mar.2	0745 185	36	150					330 25	23N009 23N010	
6	51°04'S 48°06'E	1982 Mar.3	0753 155	14	150					330 25	23N011 23N012	
7	46°40'S 48°16'E	1982 Mar.4	0751 220	50	141					330 25	23N013 23N014	

Table 3. Data on plankton collected by vertical hauls with two Norpac standard nets (one has 0.33 mm and another has 0.11 mm mesh openings) in the JARE-24 cruise of the Fuji to the Indian sector of the Antarctic Ocean, Feb. - Mar. 1983. Flow-meter was not used. The volume of water filtered by a vertical haul was estimated by assuming 100 % efficiency of the net. Samplings were carried out by H. Sasaki.

Stn. No.	Position	Ship's time		Length of wire (m)	Angle of wire (°)	Estimated depth of haul (m)	RGS Flow-meter No. Revolutions	Estimated volume of water filtered (m ³)	Wet weight of sample in a haul (g)	Wet Weight of sample per 1000 m ³ of water (g)	Mesh size of net (µm)	Sample No.	Unusual large organisms removed before weighing
1	68°59'S 24°48'E	1983 Feb.23	0800	152	10	149.7		24.17			330	24N001	
											110	24N002	
2	66°50'S 33°40'E	1983 Feb.24	0800	151	5	150.4		24.01			330	24N003	
											110	24N004	
3	64°37'S 38°41'E	1983 Feb.25	0800	155	15	149.7		24.65			330	24N005	
											110	24N006	
4	62°35'S 42°05'E	1983 Feb.26	0800	159	20	149.4		25.29			330	24N007	
											110	24N008	
5	59°41'S 42°00'E	1983 Feb.27	0800	151	5	150.4		24.01			330	24N009	
											110	24N010	
6	58°17'S 41°26'E	1983 Feb.28	0800	190	40	145.5		30.22			330	24N011	
											110	24N012	
7	53°39'S 42°04'E	1983 Mar.2	0800	177	26	159.1		28.15			330	24N013	
											110	24N014	
8	48°51'S 42°09'E	1983 Mar.3	0800	151	5	150.4		24.01			330	24N015	
											110	24N016	
9	44°14'S 42°09'E	1983 Mar.4	0800	194	45	137.2		30.85			330	24N017	
											110	24N018	
10	40°22'S 42°24'E	1983 Mar.5	0800	164	25	148.6		26.08			330	24N019	
											110	24N020	

Table 4. Data on plankton collected by simultaneous horizontal tows with MTD horizontal closing nets (0.35 mm mesh openings) in the JARE-22 cruise of the Fuji to the Indian sector of the Antarctic Ocean, Feb. 1981. The volume of water filtered by a 30 min horizontal tow is calculated to be 456 m³ when filtration efficiency of the net is 100 %. Samplings were carried out by K. Watanabe and Y. Nakajima

Stn.No.	Position	Date	Series of Net sampling No.	Ship's time		Length of wire (m)	Angle of wire (°)	Estimated depth of tow (m)	Wet weight of sample in a tow (g)	Wet weight of sample per 1000 m ³ of water (g)	Sample No.	Unusual large organisms removed before weighing	
				Net out	Net in								
88'	66°19'S 44°35'E	1981 Feb.9	1	1	1342	1421	15	45	0	0.3	0.7	22M0101	
				2	1340	1422	50	45	25	6.0	13.1	22M0102	
				3	1337	1424	85	45	50	5.5	12.1	22M0103	
				4	1333	1426	155	45	100	8.8	19.3	22M0104	
				5	1330	1429	225	45	150	8.0	17.4	22M0105	
				6	1327	1432	295	45	200	8.1	17.7	22M0106	
				7	1321	1435	435	45	300	8.1	17.7	22M0107	
				8	1310	1440	725	45	500	10.0	21.8	22M0108	
93	65°00'S 44°55'E	Feb.20	1	1	1435	1512	15	45	0	0.4	1.0	22M0201	
				2	1434	1512	30	45	10	13.3	29.0	22M0202	
				3	1433	1513	50	45	25	1.3	2.8	22M0203	
				4	1432	1514	85	45	50	1.6	3.4	22M0204	
				5	1430	1516	155	45	100	3.9	8.6	22M0205	
				6	1425	1520	295	45	200	5.1	11.2	22M0206	
				7	1421	1524	435	45	300	5.0	11.0	22M0207	
				8	1412	1530	725	45	500	15.6	34.2	22M0208	
				9	1400	1540	1145	45	800	5.0	10.9	22M0209	1 Fish larva(2.8 gr)
97	65°01'S 35°00'E	Feb.22	1	1	1537	1614	15	45	0	0.5	1.1	22M0301	2 Euphausiids(1.1 gr)
				2	1536	1615	50	45	25	1.2	2.6	22M0302	
				3	1535	1616	85	45	50	0.5	1.1	22M0303	1 Euphausiid(0.6 gr)
				4	1533	1617	155	45	100	0.9	1.9	22M0304	
				5	1530	1619	225	45	150	2.6	5.7	22M0305	
				6	1527	1621	295	45	200	1.6	3.6	22M0306	
				7	1523	1623	435	45	300	6.1	13.4	22M0307	Many Medusae(4.1 gr)
				8	1515	1628	725	45	500	—	—	22M0308	
				9	1503	1635	1145	45	800	2.2	4.9	22M0309	

Table 4. Continued.

Stn.No.	Position	Date	Series of sampling	Net No.	Ship's time		Length of wire (m)	Angle of wire (°)	Estimated depth of tow (m)	Wet weight of sample in a tow (g)	Wet weight of sample per 1000 m ³ of water (g)	Sample No.	Unusual large organisms removed before weighing
					Net out	Net in							
101	60°00'S 34°58'E	Feb.24	1	1	1419	1457	15	45	0	4.6	10.1	22M0401	
				2	1418	1458	50	45	25	43.6	95.5	22M0402	
				3	1417	1459	85	45	50	41.0	89.7	22M0403	
				4	1415	1500	155	45	100	46.3	101.4	22M0404	
				5	1413	1501	225	45	150	34.3	75.1	22M0405	
				6	1411	1502	295	45	200	19.0	41.6	22M0406	1 Polychaeta(3.1 gr)
				7	1407	1505	435	45	300	12.3	27.0	22M0407	
				8	1400	1510	725	45	500	17.6	38.5	22M0408	
				9	1350	1517	1145	45	800	5.4	11.8	22M0409	1 Medusa(48.9 gr)
105	62°29'S 40°01'E	Feb.26	1	1	1513	1553	15	45	0	284.6	623.3	22M0501	
				2	1512	1553	50	45	25	464.8	1017.9	22M0502	
				3	1511	1554	85	45	50	6.3	13.8	22M0503	
				4	1510	1555	155	45	100	6.8	14.8	22M0504	
				5	1508	1557	225	45	150	2.6	5.6	22M0505	
				6	1506	1558	295	45	200	4.0	8.7	22M0506	
				7	1502	1600	435	45	300	1.7	3.7	22M0507	
				8	1455	1605	725	45	500	4.9	10.6	22M0508	
				9	1445	1615	1145	45	800	0.7	1.6	22M0509	
109	59°58'S 45°03'E	Feb.28	1	1	1430	1508	15	45	0	248.1	543.4	22M0601	
				2	1429	1509	50	45	25	391.7	857.7	22M0602	
				3	1428	1510	85	45	50	506.0	1108.1	22M0603	
				4	1426	1511	155	45	100	800.8	1753.8	22M0604	
				5	1424	1513	225	45	150	495.9	1086.1	22M0605	
				6	1422	1514	295	45	200	51.4	112.5	22M0606	
				7	1418	1517	435	45	300	28.2	61.7	22M0607	
				8	1410	1519	725	45	500	57.6	126.2	22M0608	Many Medusae(167.9 gr)
				9	1358	1526	1145	45	800	10.8	23.5	22M0609	

Table 5. Data on plankton collected by oblique tows with ORI-C net (1.97 and 0.33 mm mesh openings) in the JARE-22 cruise of the Fuji to the Indian sector of the Antarctic Ocean, Feb. 1981. Samplings were carried out by K. Watanabe and Y. Nakajima.

Stn.No.	Position	Date	Ship's time		Length of wire (m)	Angle of wire (°)	Maximum depth of tow estimated (m)	Maximum depth* recorded (m)	Wet weight of sample in a tow (g)	Sample No.	Unusual large organisms removed before weighing
			Net out	Net in							
88'	66°19'S 44°35'E	1981 Feb.9	1455	1524	350	55	200	220	16.2	220R001	
93	65°00'S 44°55'E	Feb.20	1549	1628	500	67-56	(195-)279	310	88.3	220R002	
97	65°01'S 35°00'E	Feb.22	1644	1723	500	63	226	180	17.2	220R003	
101	60°00'S 34°58'E	Feb.24	1531	1615	500	65-50	(211-)321	300	114.5	220R004	
105	62°29'S 40°01'E	Feb.26	1628	1709	500	68-15	(187-)482	420	59.7	220R005	
109	59°58'S 45°03'E	Feb.28	1538	1615	500	65-60	250	300	151.8	220R006	

* The depth was recorded by a TS depth-distance recorder.

Table 6. Data on plankton collected by surface horizontal tows with fish larva net (1.97 and 0.33 mm mesh openings) in the JARE-22 cruise of the Fuji to the Indian sector of the Antarctic Ocean, Feb. 1981. Samplings were carried out by K. Watanabe and Y. Nakajima.

Stn. No.	Position	Date	Ship's time		Wet weight of sample in a tow (g)	Sample No.	Unusual large organisms removed before weighing
			Net out	Net in			
88'	66°19'S 44°35'E	1981 Feb.9	1500	1520	1.5	22F001	
93	65°00'S 44°55'E	Feb.20	1555	1615	1.2	22F002	
97	65°01'S 35°00'E	Feb.22	1645	1705	0.4	22F003	
101	60°00'S 34°58'E	Feb.24	1535	1555	5.7	22F004	
105	62°29'S 40°01'E	Feb.26	1632	1652	128.3	22F005	
109	59°58'S 45°03'E	Feb.28	1540	1600	132.4	22F006	