

Supplementary material

Table S1. Environmental parameters and diversity parameters of Bohai Bay. (min, max and mean \pm SD).

	Summer				Autumn			
	Min	Max	Mean	SD	Min	Max	Mean	SD
Temperature (°C)	23.44	28.56	27.17	1.31	13.39	17.32	15.36	0.98
Salinity	23.44	32.15	30.67	2.13	6.63	31.82	29.04	6.07
pH	7.77	8.24	8.05	0.12	7.70	8.71	8.23	0.23
DO (mg/L)	2.87	8.95	7.16	1.33	6.62	10.50	8.44	1.06
Chl <i>a</i> (µg/L)	2.72	25.16	10.96	6.01	1.51	84.89	18.91	25.65
DIP (µmol/L)	0.12	1.10	0.32	0.26	0.03	2.25	0.29	0.50
DSi (µmol/L)	0.30	10.04	2.77	2.34	0.80	5.85	3.12	1.77
DIN (µmol/L)	1.05	24.00	11.43	7.29	1.00	78.92	12.18	17.63
Shannon–Wiener diversity index	0.28	2.53	1.74	0.59	1.25	2.16	1.76	0.26
Pielou’s evenness index	0.08	0.54	0.41	0.11	0.38	0.59	0.48	0.05
Species richness	7.00	29.00	18.88	6.86	7.00	21.00	13.89	4.15
Abundance (ind. m ⁻³)	299.00	28219.47	4967.18	7807.98	685.11	10807.00	4199.71	3034.98

Table S2. List of zooplankton species in Bohai Bay

Group	Species
Amphipoda	<i>Hyale grandicornis</i>
	<i>Sinoedicerus homopalmulus</i>
Chaetognatha	<i>Sagitta bipunctata</i>
	<i>Sagitta crassa</i>
	<i>Sagitta enflata</i>
	<i>Sagitta ferox</i>
	<i>Sagitta pulchra</i>
	<i>Sagitta robusta</i>
	<i>Zonosagitta nagae</i>
Cladocera	<i>Bosmina longirostris</i>
	<i>Chydorus sphaericus</i>
	<i>Moina micrura</i>
	<i>Penilia avirostris</i>
	<i>Pseudevadne tergestina</i>
Copepoda	<i>Acartia dance</i>
	<i>Acartia hongii</i>
	<i>Acartia negligens</i>
	<i>Acartia omorii</i>
	<i>Acartia omorii bradford</i>
	<i>Acartia pacifica</i>
	<i>Acartia pacifica steuer</i>
	<i>Acartia southwelli</i>
	<i>Acartia amboinensis</i>
	<i>Calanus sinicus</i>

	<i>Calocalanus pavoninus</i>
	<i>Canthocalanus pauper</i>
	<i>Centropages abdominalis</i>
	<i>Centropages dorsispinatus</i>
	<i>Centropagrs dorsispinatus</i>
	<i>Cotycaeus affinis</i>
	<i>Ctennocalanus vanus</i>
	<i>Cyclops vicinus</i>
	<i>Eurytemora pacifica</i>
	<i>Halicyclois sinensis</i>
	<i>Halicyclops sinensis</i>
	<i>Labidocera euchaeta</i>
	<i>Mesocyclops leukarti</i>
	<i>Nannocalanus minor</i>
	<i>Oithona attenuata</i>
	<i>Oithona nana</i>
	<i>Oithona similis</i>
	<i>Paracalanus crassirostris</i>
	<i>Paracalanus parvus</i>
	<i>Pseudodiaptomus bulbosus</i>
	<i>Pseudodiaptomus marinus</i>
	<i>Thermocyclops kawamurai</i>
Decapoda	<i>Acetes chinensis</i>
	<i>Acetes japonicus</i>
	<i>Penaeus chinensis</i>
	<i>Penaeus japonicus</i>
Euphausiacea	<i>Euphausia nana</i>
	<i>Euphausia pacifica</i>
	<i>Euphausia tenera</i>
	<i>Thysanoessa inermis</i>
Hydromedusa	<i>Aurelia aunrita</i>
	<i>Boaugainuillia britannica</i>
	<i>Clytia hemispherica</i>
	<i>Ectopleura dumortrieri</i>
	<i>Eirene menoni</i>
	<i>Helgicirrha malayensis</i>
	<i>Irene hexanemalis</i>
	<i>Livenella assimilis</i>
	<i>Malagazzia carolinae</i>
	<i>Nemopsis bathei</i>
	<i>Obelia</i> sp.
	<i>Phialidium discoda</i>
	<i>Pleurobrachia globosa</i>
	<i>Podocoryne minima</i>
	<i>Rathkea octopunctata</i>
	<i>Sugiura chengshanense</i>
	<i>Tiaropsis multicirrata</i>
	<i>Turritopsis nutricula</i>
	<i>Uaritentaculata yantaiensis</i>

Mysidacea	<i>Acanthomysis longirostris</i>
	<i>Neomysis intermedia</i>
	<i>Orientomysis aspera</i>
	<i>Siriella thompsoni</i>
	<i>Tenagomysis orientalis</i>
Tunicate	<i>Oikopirura dioica</i>
Ostracoda	<i>Cypridina acuminata</i>
Pelagic larvae	Argyrotheca trochophora
	Balanus larva
	Bipinnaria larva
	Bivalve larvae
	Bivalve larve
	Brachyura zoea larva
	Calytopis larva
	Copepodite larva
	Doliolum miilleri larva
	Echinopluteus larva
	Fish eggs
	Fish larva
	Gastropoda larva
	Mysidacea larva
	Nauplius larva
	Neptunus trituberculatus zoea larva
	Ophiopluteus larva
	Polychaeta larva
	Porcellana zoea larva
	Portunus pelagicus larva
	Squilla oratoria larva
	Tornaria larva
	Veliger larva
Polychaeta	<i>Alciopina parasitica</i>

Table S3. Group abundance (ind. m⁻³) at each station in summer

Station	Chaetognatha	Cladocera	Copepoda	Hydromedusa	Pelagic larvae	Polychaeta	others
B1	157.00	—	135.00	—	—	—	7.00
B2	192.50	—	1634.50	50.50	461.00	22.00	28.50
B4	63.33	—	611.11	392.22	834.44	0.56	113.33
B5	159.62	230.77	847.69	425.77	739.92	115.38	—
B6	287.10	10928.69	7423.95	166.00	9028.95	15.26	4.47
B8	139.55	90.91	90.91	2.82	2101.36	—	45.45
B9	141.00	—	8.50	54.00	705.00	5.00	6.00
B10	327.00	—	16.00	20.00	28.00	—	—
B11	542.22	111.11	977.22	12.78	4622.22	—	—
B12	0.71	—	144.29	—	216.43	—	242.86
B14	1.36	—	282.73	0.45	681.82	—	45.91
B16	26.83	—	9525.00	122.67	11472.00	83.33	5.00
B17	8.07	35.71	1901.07	124.29	4438.57	—	36.07
B19	89.86	253.18	500.00	348.65	491.14	—	113.64
H2	1.25	—	125.00	252.50	425.31	—	—

H4	8.33	—	194.44	0.56	111.11	—	27.78
J1	—	1142.86	715.29	—	1142.86	—	1.43

Table S4. Group abundance (ind. m⁻³) at each station in autumn

Station	Chaetognatha	Cladocera	Copepoda	Hydromedusa	Pelagic larvae	Polychaeta	Others
B1	34.00	200.00	5007.00	109.00	—	500.00	1611.00
B2	125.00	—	5751.88	1.88	312.50	—	375.63
B3	41.15	—	5432.69	2.69	308.85	—	77.31
B5	160.00	230.77	462.31	425.77	3617.31	115.38	696.15
B6	58.16	—	1582.89	0.53	131.84	26.84	0.26
B7	319.55	—	3504.09	48.64	318.64	90.91	45.45
B10	191.43	—	3147.14	—	71.43	0.71	285.71
B11	130.00	—	7607.00	152.00	1050.00	—	—
B12	30.83	166.67	1860.00	0.83	—	83.33	170.83
B13	28.33	—	1227.50	55.56	166.67	0.28	—
B14	57.73	—	318.18	0.45	1545.45	45.45	90.91
B15	81.11	—	1648.70	55.56	277.78	18.70	—
B16	88.00	—	1806.67	—	669.33	0.67	—
B17	10.00	—	1510.00	—	333.33	—	1.67
B18	44.39	—	637.27	0.15	1805.15	30.30	—
B19	17.78	—	467.33	—	200.00	—	—
H1	5.00	1600.00	7702.00	—	1400.00	—	100.00
H5	4.47	26.58	580.53	—	106.84	—	0.79
J1	10.77	770.00	6776.15	63.85	396.92	0.77	30.77

Table S5. Abundance (ind. m⁻³) of dominant species at each station in summer

Station	<i>Paracalanus parvus</i>	<i>Sagitta crassa</i>	<i>Oikopirura dioica</i>	<i>Pleurobrachia globosa</i>	<i>Pseudevadne tergestina</i>	<i>Penilia avirostris</i>
B1	—	155.00	—	—	—	—
B2	144.50	168.00	—	—	—	—
B4	166.67	61.67	1944.44	388.89	—	—
B5	385.38	159.62	696.15	386.15	153.85	76.92
B6	3547.89	261.32	375.00	143.68	6264.21	4664.47
B8	—	139.55	—	1.36	45.45	45.45
B9	300.00	141.00	—	45.50	—	—
B10	600.00	326.00	—	102.00	—	—
B11	4003.89	479.44	333.33	5.00	111.11	—
B12	0.71	0.71	1230.00	—	—	—
B14	—	1.36	90.91	0.45	—	—
B16	3833.33	105.83	83.33	26.67	—	—
B17	2250.00	70.36	—	4.29	35.71	—
B19	2900.68	83.41	68.18	91.82	228.64	204.55
H2	—	1.25	—	251.56	—	—
H4	55.56	6.11	111.11	—	—	—
J1	142.86	—	—	—	1142.86	—

Table S6. Abundance (ind. m⁻³) of dominant species at each station in autumn

Station	<i>Paracalanus parvus</i>	<i>Sagitta crassa</i>	<i>Oikopirura dioica</i>	<i>Calanus sinicus</i>	<i>Cotycaeus affinis</i>	<i>Oithona similis</i>
B1	2700.00	30.00	1611.00	400.00	1600.00	100.00

B2	1875.63	117.50	375.00	—	2063.75	62.50
B3	2813.46	38.46	76.92	538.85	1693.85	385.77
B5	385.38	160.00	696.15	—	—	—
B6	342.89	55.26	100.00	606.58	396.32	78.95
B7	2365.91	265.45	45.45	90.91	956.36	45.45
B10	1575.00	180.71	142.86	71.43	1500.71	—
B11	6606.00	123.00	—	—	901.00	—
B12	1690.00	30.83	170.83	—	170.00	—
B13	333.61	21.67	—	225.00	56.11	27.78
B14	90.91	55.45	90.91	45.45	—	90.91
B15	759.26	75.19	—	37.04	574.63	—
B16	804.67	80.00	—	—	535.33	133.33
B17	510.00	10.00	1.67	—	333.33	—
B18	333.48	40.30	—	45.76	197.42	—
B19	178.22	8.67	—	44.44	200.22	22.22
H1	200.00	4.00	—	—	—	1500.00
H5	289.47	4.21	0.26	—	0.26	184.21
J1	—	10.77	—	—	—	—