

Supplementary materials

Table S1. Numerical abundance (ind. m⁻³) of copepods in the East Sea.

Table S2. C/N ratio, stable carbon ($\delta^{13}\text{C}$) and nitrogen ($\delta^{15}\text{N}$) isotope ratios of food sources and copepods in the south region of the subpolar front of the East Sea.

Table S3. C/N ratio, stable carbon ($\delta^{13}\text{C}$) and nitrogen ($\delta^{15}\text{N}$) isotope ratios of food sources and copepods in the north region of the subpolar front of the East Sea.

Table S4. Conover post hoc test results for pair-wise differences in $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values among pico- to micro-POMs within the ~200-m depth layer (a) and among 11 copepods (b), *Calanus sinicus*, *Clausocalanus pergens*, *Ctenocalanus vanus*, *Mesocalanus tenuicornis*, *Metridia pacifica*, *Neocalanus plumchrus*, *Paracalanus parvus* s. l., *Pseudocalanus newmani*, *Scolecithricella minor*, *Corycaeus affinis*, *Oithona atlantica*, and *Triconia conifera* in the south region of the subpolar front of the East Sea.

Table S5. Conover post hoc test results for pair-wise differences in $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values among pico- to micro-POMs within the ~200-m depth layer (a) and among nine copepods (b), *Eucalanus bungii*, *Metridia pacifica*, *Microcalanus pygmaeus*, *Pseudocalanus minutus*, *P. newmani*, *Neocalanus cristatus*, *N. plumchrus*, *Scolecithricella minor*, and *Oithona atlantica* in the north region of the subpolar front of the East Sea.

Table S1

Species	Station					
	M4	M7	M8	M12	M13	M15
Calanoida						
Acartiidae						
<i>Acartia omorii</i>	0.59					
Aetideidae						
<i>Gaetanus minor</i>		0.38	0.58	0.19		0.23
Candaciidae						
<i>Candacia bipinata</i>	0.20		0.58			
Calanidae						
<i>Calanus sinicus</i>	0.20	1.71	2.57	0.10		
<i>Mesocalanus tenuicornis</i>	36.57		10.74	0.10		
<i>Neocalanus cristatus</i>		0.19	0.35	0.96	1.04	2.30
<i>Neocalanus plumchrus</i>	15.25	3.23	4.67	35.17	16.96	40.44
Clausocalanidae						
<i>Ctenocalanus vanus</i>	1.37	0.19	0.35			
<i>Clausocalanus pergens</i>	4.89	3.61	1.63			
<i>Microcalanus pygmaeus</i>	1.37		0.70	0.58	0.87	1.38
<i>Pseudocalanus newmani</i>	15.45	89.30	25.21	2.88	3.81	11.03
<i>Pseudocalanus minutus</i>	0.20			5.29	5.89	21.37
Eucalanidae						
<i>Eucalanus bungii</i>	0.39			1.54	1.21	0.46
Euchaetidae						
<i>Paraeuchaeta elongata</i>	1.76	1.90	3.38	2.59	1.04	3.91
Lucicutiidae						
<i>Lucicutia flavicornis</i>	0.20	0.38				
Metridinidae						
<i>Metridia pacifica</i>	42.05	82.27	35.94	10.57	25.27	23.67
Paracalanidae						
<i>Paracalanus parvus</i> s.l.	5.67	0.38	3.03			
Scolecithrichidae						
<i>Scolecithricella minor</i>	2.54	2.66	4.43	2.31	4.85	8.96
Cyclopoida						
Oithonidae						
<i>Oithona atlantica</i>	183.65	42.94	29.76	0.67	3.12	3.45
Poecilostomatoida						
Corycaeidae						
<i>Croycaeus affinis</i>	7.43	1.90	9.45			
Oncaeidae						
<i>Triconia conifera</i>	1.76	1.33				
<i>Oncaea venusta</i>	0.20	0.38	0.12			
<i>Oncaea mediterranea</i>	0.59	2.28				

Table S2.

	Prosome Length	N	C/N ratio		$\delta^{13}\text{C}$		$\delta^{15}\text{N}$	
			Mean	SD	Mean	SD	Mean	SD
Surface layer								
Pico-POM		6	7.26	1.26	−25.52	0.74	3.03	0.35
Nano-POM		6	6.70	0.22	−24.02	0.33	3.70	0.61
Micro-POM		6	9.37	0.89	−21.75	0.69	4.88	1.27
Subsurface maximum layer								
Pico-POM		3	4.70	0.17	−24.67	0.27	1.68	0.87
Nano-POM		3	7.05	0.42	−23.59	1.31	2.07	0.26
Micro-POM		3	7.05	1.27	−22.90	0.45	4.35	0.40
100-m depth layer								
Pico-POM		3	9.57	0.66	−25.34	1.43	6.15	0.53
Nano-POM		3	6.31	0.76	−24.29	0.54	5.65	0.31
Micro-POM		3	6.70	0.55	−23.94	0.86	7.62	0.67
200-m depth layer								
Pico-POM		3	9.64	1.73	−25.47	1.39	7.27	0.44
Nano-POM		3	6.33	0.76	−23.17	0.47	5.53	1.04
Micro-POM		3	9.52	0.92	−24.17	0.78	9.76	0.39
Calanoida								
<i>Calanus sinicus</i>	2.21	11	3.38	0.04	−22.03	0.53	7.45	0.68
<i>Clausocalanus pergens</i>	0.69	5	3.39	0.02	−23.29	0.12	5.47	0.25
<i>Ctenocalanus vanus</i>	0.86	5	3.37	0.07	−23.32	0.19	4.36	0.31
<i>Mesocalanus tenuicornis</i>	1.85	5	3.42	0.02	−22.94	0.08	6.80	0.55
<i>Metridia pacifica</i>	2.08	5	3.39	0.04	−22.57	0.68	6.25	0.23
<i>Neocalanus plumchrus</i>	3.60	5	3.56	0.03	−21.17	0.22	9.77	0.48
<i>Paracalanus parvus</i> s. l.	0.68	5	3.41	0.01	−22.65	0.16	6.16	0.22
<i>Pseudocalanus newmani</i>	0.78	5	3.34	0.02	−23.39	0.18	6.26	0.22
Cyclopoida								
<i>Corycaeus affinis</i>	0.73	5	3.46	0.05	−22.45	0.32	6.26	0.27
<i>Oithona atlantica</i>	0.71	5	3.29	0.02	−23.23	0.05	5.21	0.16
<i>Triconia conifera</i>	0.66	5	3.51	0.01	−23.60	0.01	4.36	0.37

Table S3.

	Prosome Length	N	C/N ratio		$\delta^{13}\text{C}$		$\delta^{15}\text{N}$	
			Mean	SD	Mean	SD	Mean	SD
Surface layer								
Pico-POM		6	5.23	1.76	-25.35	0.42	-0.65	0.30
Nano-POM		6	7.11	0.82	-23.94	0.30	3.10	0.52
Micro-POM		6	11.09	1.50	-21.27	0.67	6.18	0.67
Subsurface maximum layer								
Pico-POM		3	8.83	2.42	-25.44	0.47	1.27	0.14
Nano-POM		3	12.42	0.92	-23.59	0.26	3.03	0.60
Micro-POM		3	15.76	0.32	-19.41	0.21	5.33	0.92
100-m depth layer								
Pico-POM		3	11.20	1.51	-24.19	0.15	5.52	1.11
Nano-POM		3	8.49	0.39	-22.55	0.29	4.96	0.91
Micro-POM		3	15.04	1.24	-24.11	0.22	6.88	0.24
200-m depth layer								
Pico-POM		3	7.38	1.70	-26.29	0.36	6.82	0.82
Nano-POM		3	12.58	1.49	-23.82	0.15	5.16	0.81
Micro-POM		3	11.06	2.38	-24.48	1.37	10.17	0.47
Calanoida								
<i>Eucalanus bungii</i>	6.40	5	3.53	0.05	-20.65	0.31	5.86	0.28
<i>Metridia pacifica</i>	2.08	5	3.39	0.04	-23.11	0.39	5.18	0.22
<i>Microcalanus pygmaeus</i>	0.66	5	3.72	0.13	-22.31	0.14	9.30	0.07
<i>Neocalanus cristatus</i>	6.82	5	3.30	0.02	-22.06	0.23	4.58	0.49
<i>Neocalanus plumchrus</i>	3.60	5	3.63	0.07	-20.25	0.30	6.28	0.42
<i>Pseudocalanus minutus</i>	1.28	5	4.22	0.03	-21.66	0.45	6.47	0.67
<i>Pseudocalanus newmani</i>	0.78	5	3.80	0.14	-22.64	0.41	5.02	0.57
<i>Scolecithricella minor</i>	0.99	5	4.17	0.36	-22.77	0.50	8.05	0.68
Cyclopoida								
<i>Oithona atlantica</i>	0.71	5	3.47	0.16	-22.81	0.37	7.21	0.59

Table S4.

(a)	Surface Pico	Surface Nano	Surface Micro	SCM Pico	SCM Nano	SCM Micro	100-m Pico	100-m Nano	100-m Micro	200-m Pico	200-m Nano
Surface Nano	**/*										
Surface Micro	**/**	**/ns									
SCM Pico	/*	/*	/*								
SCM Nano	/*	ns/*	ns/*	ns/ns							
SCM Micro	/*	*/ns	*/ns	/*	ns/*						
100-m Pico	ns/*	ns/*	*/ns	ns/*	ns/*	/*					
100-m Nano	/*	ns/*	*/ns	ns/*	ns/*	/*	ns/ns				
100-m Micro	/*	ns/*	/*	ns/*	ns/*	/*	ns/*	ns/*			
200-m Pico	ns/*	ns/*	/*	ns/*	ns/*	/*	ns/*	ns/*	ns/*		
200-m Nano	/*	ns/*	*/ns	/*	ns/*	ns/*	ns/*	*/ns	ns/*	ns/*	
200-m Micro	/*	ns/*	/*	/*	ns/*	/*	ns/*	ns/*	ns/*	*/ns	ns/*
(b)	<i>C. sinicus</i>	<i>C. pergens</i>	<i>C. vanus</i>	<i>M. tenuicornis</i>	<i>M. pacifica</i>	<i>N. plumchrus</i>	<i>P. parvus</i> s. l.	<i>P. newmani</i>	<i>C. affinis</i>	<i>O. atlantica</i>	
<i>C. pergens</i>	**/**										
<i>C. vanus</i>	**/**	ns/**									
<i>M. tenuicornis</i>	**/ns	**/**	**/**								
<i>M. pacifica</i>	/**	**/**	**/**	**/ns							
<i>N. plumchrus</i>	**/**	**/**	**/**	**/**	**/**						
<i>P. parvus</i> s. l.	/**	**/**	**/**	*/ns	ns/*	**/**					
<i>P. newmani</i>	**/**	ns/**	ns/**	**/ns	**/*	**/**	**/ns				
<i>C. affinis</i>	ns/**	**/**	**/**	*/ns	ns/ns	**/**	ns/ns	**/ns			
<i>O. atlantica</i>	**/**	ns/ns	ns/**	**/**	**/**	**/**	**/**	ns/**	**/**		
<i>T. conifera</i>	**/**	**/**	**/ns	**/**	**/**	**/**	**/**	ns/**	**/**	**/**	

Each cell of the table includes the results for $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ ($\delta^{13}\text{C}/\delta^{15}\text{N}$, respectively).

* ≤ 0.05 ; ** ≤ 0.01 ; *** ≤ 0.001 ; ns, not significant ($p > 0.05$).

Table S5.

(a)	Surface Pico	Surface Nano	Surface Micro	SCM Pico	SCM Nano	SCM Micro	100-m Pico	100-m Nano	100-m Micro	200-m Pico	200-m Nano
Surface Nano	*/**										
Surface Micro	*/**	*/**									
SCM Pico	ns/*	/*	/*								
SCM Nano	/*	ns/ns	/*	/*							
SCM Micro	/*	/*	*/ns	/*	/*						
100-m Pico	/*	ns/*	*/ns	/*	/*	*/ns					
100-m Nano	/*	/*	*/ns	/*	/*	*/ns	*/ns				
100-m Micro	/*	ns/*	*/ns	/*	/*	/*	ns/*	/*			
200-m Pico	/*	/*	*/ns	ns/*	/*	*/ns	*/ns	*/ns	*/ns		
200-m Nano	/*	ns/*	*/ns	/*	ns/*	*/ns	*/ns	*/ns	ns/*	/*	
200-m Micro	ns/*	ns/*	/*	ns/*	ns/*	/*	ns/*	/*	ns/*	/*	ns/*
(b)	<i>E. bungii</i>	<i>M. pacifica</i>	<i>M. pygmaeus</i>	<i>P. minutus</i>	<i>P. newmani</i>	<i>N. cristatus</i>	<i>N. plumchrus</i>	<i>S. minor</i>			
<i>M. pacifica</i>	*/**										
<i>M. pygmaeus</i>	*/**	*/**									
<i>P. minutus</i>	*/ns	*/**	*/**								
<i>P. newmani</i>	*/*	ns/ns	ns/**	/*							
<i>N. cristatus</i>	/*	*/ns	ns/**	*/ns	ns/**						
<i>N. plumchrus</i>	ns/ns	*/**	*/**	*/ns	*/**	*/**					
<i>S. minor</i>	*/**	ns/**	ns/**	/*	ns/**	*/**	*/**			*/**	
<i>O. atlantica</i>	*/**	ns/**	*/**	*/ns	ns/**	*/**	*/**	*/**		*/**	ns/ns

Each cell of the table includes the results for $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ ($\delta^{13}\text{C}/\delta^{15}\text{N}$, respectively).

* ≤ 0.05 , ** ≤ 0.01 , *** ≤ 0.001 ; ns, not significant ($p > 0.05$).