The following supplement accompanies the article

Trophodynamics of anchovy in a non-upwelling system: direct comparison with sardine

N. Nikolioudakis*, S. Isari, S. Somarakis

Institute of Marine Biological Resources and Inland Waters, Hellenic Centre for Marine Research, Thalassocosmos, Heraklion 71003, Crete, Greece

*Email: niknikos@hcmr.gr

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Supplement. Detailed information on the diet of juvenile and adult anchovy (*Engraulis encrasicolus*) in the North Aegean Sea, in both terms of prey and prey sizes. The taxa that differentiate the diet between (1) juveniles and adults, (2) between summer and winter and (3) between anchovies and sardines are also provided. Finally, box-plots of captured fish at each sampling time and sampling period are shown

Table S1. *Engraulis encrasicolus.* Contribution of prey to anchovy diet based on numbers (%n) and carbon content (%C)

Category	Taxon	July 2007		July 2007		December 2007		December 2007		July 2008		July 2008		February 2009		February 2009	
		juveniles		adults		juveniles		adults		juveniles		adults		juveniles		adults	
		%n	%C	%n	%C	%n	%C	%n	%C	%n	%C	%n	%C	%n	%C	%n	%C
Appendiculari	Appendicularians	0.48	0.06	0.66	0.08	9.59	0.48	20.59	1.15	1.06	0.09	0.46	0.04	0.51	0.02	0.64	0.03
Bivalves	Lamellibranchia larvae	9.15	1.61	4.68	0.55	1.21	0.06	0.45	0.03	0.36	0.04	0.50	0.05				
Cirripedes	Cirripedes nauplii			0.25	0.41	2.55	1.72	0.24	0.26								
Cladocerans	*Evadne spinifera*	0.48	0.11			0.74	0.07										
	Penilia avirostris	2.18	0.63	1.67	0.51	0.56	0.08			1.1	0.27	0.98	0.25				
	Podon intermedius	6.33	4.33	2.00	1.86	0.14	0.04	0.66	0.22								
	Unidentified	1.00	0.58	0.43	0.65												
Copepods	*Acartia clausi*	20.36	22.98	37.70	45.21	4.18	1.36	2.06	0.82	11.34	8.29	12.21	9.74				

	Calanus spp.					5.97	15.47	2.58	9.20							
	Calocalanus spp.					0.14	0.02	0.49	0.09							
	Candacia spp.					3.96	11.30	1.78	7.63							
	Centropages spp.	0.97	2.99	2.61	7.29	38.16	53.75	37.75	69.29					65.00	94.40	67.00	91.53
	Clauso-Paracalanidae	3.70	4.69	2.01	1.49	9.12	3.00	10.62	4.32	4.68	3.10	4.52	3.06	10.38	3.57	5.46	1.82
	Clytemnestra spp.	0.30	0.20														
	Copepod nauplii	1.44	0.37	0.5	0.13	1.38	0.16	0.98	0.13	0.36	0.08	0.5	0.11				
	Corycaeidae	2.63	2.76	3.42	2.68	4.94	1.66	2.65	1.06	2.04	1.33	0.91	0.61	3.09	1.05	5.65	1.84
	Eucalanus spp.					0.09	2.04										
	Euterpina acutifrons	6.74	1.83	13.45	2.76	1.40	0.11	0.28	0.03	15.40	2.64	13.01	2.29	0.71	0.06	0.26	0.02
	Harpacticoids	0.95	0.24			0.25	0.03	0.28	0.03							0.18	0.02
	Isias clavipes	0.23	0.69	0.49	1.28	0.39	0.38	0.70	0.77								
	Microsetella rosea	0.53	0.38	0.17	0.07	0.19	0.04			1.91	0.74	2.22	0.87				
	Oithona spp.	20.74	3.47	2.93	0.34	0.91	0.05	0.76	0.05	5.68	0.60	5.48	0.58				
	Oncaea spp.	11.16	1.73	15.34	1.80	7.10	0.30	10.96	0.63	35.77	3.38	38.40	3.71	17.19	0.85	17.23	0.81
	Pontellidae					0.32	0.20	0.24	0.19								
	Sapphirina spp.	0.60	1.45														
	Temora stylifera	5.19	27.29	2.89	13.84	2.82	4.82	1.33	3.36	18.54	74.04	18.34	74.96			1.24	2.35
	Unidentified	2.12		3.45		3.64		4.58		1.24		2.13		3.11		2.30	
Decapods	Crab (zoea)	0.05	1.01	0.03	0.56	0.01	0.10	0.01	0.09	0.08	1.09	0.07	0.93	0.01	0.05	0.01	0.08
	Shrimp (mysis)	0.07	7.66	0.02	2.07	0.05	2.50	0.01	0.65	0.03	3.29	0.02	2.16			0.03	1.50
Gastropods	Gastropod larvae	2.37	10.43	3.61	11.25	0.19	0.26			0.41	1.02	0.25	0.64				
	Pteropods	0.23	2.51	1.69	6.17												

Table S2. Taxa detected by SIMPER to contribute (% Con.) to the similarity (Av. Sim.) of the diets of juvenile and adult anchovies *Engraulis encrasicolus* in each sampling period. Calculations have been based both on the numerical and carbon contributions (%n and %C, respectively) of prey taxa. Only taxa with >10% contribution are presented. S07 = July 2007, W07 = December 2007, S08 = July 2008, W09 = February 2009

S07 (Av. Sim.: 73.47)			**S07** (Av. Sim.: 58.07)		
Taxon	%n	% Con.	Taxon	%C	% Con.
Acartia clausi	5.31	18.72	*Acartia clausi*	3.46	18.39
Oncaea spp.	3.53	11.92	*Temora stylifera*	2.74	16.68
Euterpina acutifrons	3.12	10.92	Gastropod larvae	2.94	13.20
S08 (Av. Sim.: 87.39)			**S08** (Av. Sim.: 75.59)		
Taxon	%n	% Con.	Taxon	%C	% Con.
Oncaea spp.	6.09	24.52	*Temora stylifera*	6.01	34.62
Temora stylifera	4.29	17.46	Crab (zoea)	3.92	21.21
Euterpina acutifrons	3.75	14.37	*Acartia clausi*	2.07	11.58
Acartia clausi	3.63	13.52			
W07 (Av. Sim.: 69.95)			**W07** (Av. Sim.: 64.47)		
Taxon	%n	% Con.	Taxon	%C	% Con.
Centropages spp.	6.45	28.73	*Centropages* spp.	6.27	37.31
Para-Clausocalanidae	3.00	11.74	*Calanus* spp.	2.77	17.52
Oncaea spp.	2.75	10.36	*Candacia* spp.	2.02	11.77
W09 (Av. Sim.: 87.66)			**W09** (Av. Sim.: 78.40)		
Taxon	%n	% Con.	Taxon	%C	% Con.
Centropages spp.	8.30	49.69	*Centropages* spp.	8.42	71.95
Oncaea spp.	4.13	23.50			
Para-Clausocalanidae	2.57	13.05			
Corycaeidae	2.14	11.17			

Table S3. Numerical (%n) and carbon (%C) contribution to anchovy *Engraulis encrasicolus* diet per size-class of zooplankton (copepods+cladocerans) prey. J = juveniles, A = adults. χ^2 = Chi-square statistic and the associated p-value between the size-frequency distribution of zooplankton prey of juvenile and adult fish in each sampling period

Size-class (μm)	July 2007				December 2007				July 2008				February 2009			
	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
	%n	%n	%C	%C	%n	%n	%C	%C	%n	%n	%C	%C	%n	%n	%C	%C
001–200																
201–400																
401–600	38.77	24.46	5.87	2.84	9.96	18.79	0.48	0.92	42.72	44.80	4.24	4.49	15.87	17.47	0.76	0.83
601–800	47.89	63.19	36.48	51.48	21.54	14.10	5.66	4.45	36.30	35.44	15.90	16.51	12.03	6.86	3.91	2.14
801–1000	3.15	3.90	3.05	3.88	6.83	2.66	1.99	0.85	2.01	1.07	1.36	0.73	2.78	5.20	0.93	1.71
1001–1200																
1201–1400	10.19	7.45	54.61	41.70	51.76	59.12	62.48	77.78	18.97	18.70	78.50	78.27	69.32	70.47	94.40	95.32
1401–1600																
1601–1800					5.80	2.79	15.19	8.01								
1801–2000					0.46	1.27	1.24	0.16								
2001–2200					3.66	1.26	12.96	7.84								
χ^2	6.25		5.47		10.41		7.88		0.393		0.393		1.85		1.01	
p-value	0.100		0.140		0.109		0.247		0.247		0.942		0.605		0.800	

Table S4. Taxa detected by SIMPER as distinguishing the diets of anchovy *Engraulis encrasicolus* between sampling periods, as well as between summer and winter. Calculations were based both on the numerical and carbon contributions (%n and %C, respectively) of prey taxa. Only taxa with >10% contribution are presented. The sampling period in which the %n or %C contribution was greatest is highlighted in bold for each taxon and the % contribution (% Con.) of each species to the dissimilarity (Av. Dis.) between the diet compositions in each sampling period is given. S07 = July 2007, W07 = December 2007, S08 = July 2008, W09 = February 2009

%n					%C				
S07–W07	Taxon	S07	W07	% Con.	S07–W07	Taxon	S07	W07	% Con.
(Av. Dis.: 57.43)	*Centropages* spp.	1.15	**6.45**	14.45	(Av. Dis.: 69.33)	*Centropages* spp.	1.20	**6.27**	16.71
	Acartia clausi	**5.31**	1.62	10.10					
S07–S08	Taxon	S07	S08	% Con.	S07–S08	Taxon	S07	S08	% Con.
(Av. Dis.: 37.59)	*Oncaea* spp.	3.53	**6.09**	11.07	(Av. Dis.: 47.61)	*Temora stylifera*	2.74	**6.01**	17.31
	Temora stylifera	1.90	**4.29**	10.39		Crab (zoea)	2.88	**3.92**	14.03
						Gastropod larvae	**2.94**	0.46	12.21
S07–W09	Taxon	S07	W09	% Con.	S07–W09	Taxon	S07	W09	% Con.
(Av. Dis.: 66.22)	*Centropages* spp.	1.15	**8.30**	20.58	(Av. Dis.: 74.83)	*Centropages* spp.	1.20	**8.42**	27.82
	Acartia clausi	**5.31**	0	15.33		*Acartia clausi*	**3.46**	0	12.15
						Gastropod larvae	**2.94**	0	10.16
S08–W09	Taxon	S08	W09	% Con.	S08–W09	Taxon	S08	W09	% Con.
(Av. Dis.: 64.28)	*Centropages* spp.	0	**8.30**	27.68	(Av. Dis.: 77.04)	*Centropages* spp.	0	**8.42**	35.19
	Temora stylifera	**4.29**	0.58	12.38		*Temora stylifera*	**6.01**	0.59	21.84
	Acartia clausi	**3.63**	0	12.12		Crab (zoea)	**3.92**	0.69	14.07
	Euterpina acutifrons	**3.75**	0.36	11.30					
W07–S08	Taxon	W07	S08	% Con.	W07–S08	Taxon	W07	S08	% Con.
(Av. Dis.: 60.60)	*Centropages* spp.	**6.45**	0	18.34	(Av. Dis.: 72.66)	*Centropages* spp.	**6.27**	0	21.95
						Temora stylifera	1.45	**6.01**	16.64
						Crab (zoea)	0.71	**3.92**	12.30
						Calanus spp.	2.77	0	10.08
W07–W09	Taxon	W07	W09	% Con.	W07–W09	Taxon	W07	W09	% Con.
(Av. Dis.: 42.37)	Appendicularians	**3.08**	0.50	13.50	(Av. Dis.: 48.13)	*Centropages* spp.	6.27	**8.42**	19.13
	Calanus spp.	**2.08**	0	10.11		*Calanus* spp.	**2.77**	0	17.58
						Candacia spp.	**2.02**	0	13.12
Summer–Winter	Taxon	Summer	Winter	% Con.	Summer–Winter	Taxon	Summer	Winter	% Con.
(Av. Dis.: 62.13)	*Centropages* spp.	2.07	**8.23**	18.09	(Av. Dis.: 62.13)	*Centropages* spp.	0.60	**7.35**	18.87
	Temora stylifera	**5.55**	1.25	12.98		*Temora stylifera*	**4.38**	1.02	9.69
						Crab (zoea)	**3.40**	0.70	8.29
						Acartia clausi	**2.76**	0.40	6.27
						Gastropod larvae	**1.70**	0.07	4.12

Table S5. Taxa detected by SIMPER as distinguishing the diets between anchovies *Engraulis encrasicolus* (ANC) and sardines *Sardina pilchardus* (SAR) in each sampling period, as well as in summer and winter, based on the numerical contribution (%n) of prey taxa. Only taxa with >5% contribution are presented. The sampling period in which the %n contribution was greatest is highlighted in bold for each taxon and the % contribution (% Con.) of each species to the dissimilarity (Av. Dis.) between the diet compositions in each sampling period is given. S07 = July 2007, W07 = December 2007, S08 = July 2008, W09 = February 2009

S07 (Av. Dis.: 70.09)			
Taxon	ANC	SAR	% Con.
Acartia clausi	**5.94**	1.32	9.21
Protoperidinium sp.	0	**3.87**	7.73
Guinardia sp.	0	**3.52**	7.03
Tintinnids	0	**3.06**	6.11
Gastropod larvae	**2.91**	0.20	5.41
Euterpina acutifrons	**3.65**	0.95	5.40
Oncaea spp.	**3.80**	1.16	5.25
Prorocentrum sp.	0	**2.47**	5.00

W07 (Av. Dis.: 84.78)			
Taxon	ANC	SAR	% Con.
Appendicularians	**4.52**	0	7.46
Centropages spp.	**6.50**	2.16	7.20
Chaetocerus sp.	0	**4.09**	6.76
Nitzchia sp.	0	**3.98**	6.58
Ceratium sp.	0	**3.16**	5.21

S08 (Av. Dis.: 67.10)			
Taxon	ANC	SAR	% Con.
Protoperidinium sp.	0	**3.80**	7.65
Oncaea spp.	**6.19**	2.54	7.35
Ceratium sp.	0	**2.92**	5.91
Coscinodiscus sp.	0	**2.89**	5.80
Acartia clausi	**3.73**	0.99	5.50
Guinardia sp.	0	2.72	5.46

W09 (Av. Dis.: 65.67)			
Taxon	ANC	SAR	% Con.
Centropages spp.	**3.74**	1.28	7.74
Oncaea spp.	**3.95**	2.46	4.98

Summers (Av. Dis.: 68.86)			
Taxon	ANC	SAR	% Con.
Protoperidinium sp.	0	**3.84**	7.70
Acartia clausi	**4.83**	1.16	7.26
Oncaea spp.	**5.00**	1.85	6.52
Guinardia sp.	0	**3.12**	6.30
Tintinnids	0	**2.50**	5.08

Winters (Av. Dis.: 84.80)			
Taxon	ANC	SAR	% Con.
Centropages spp.	**7.72**	1.99	11.43
Chaetocerus sp.	0	**3.98**	7.80
Nitzchia sp.	0	**3.68**	7.19
Oncaea spp.	**3.84**	0.64	6.32
Ceratium sp.	0	**3.07**	6.03
Rhizosolenia sp.	0	**2.94**	5.89
Protoperidinium sp.	0	**2.84**	5.63
Guinardia sp.	0	**2.49**	5.00

Table S6. Taxa detected by SIMPER as distinguishing the diets between anchovies *Engraulis encrasicolus* (ANC) and sardines *Sardina pilchardus* (SAR) in each sampling period, as well as in summers and winters, based on the carbon content (%C) of prey taxa. Only taxa with >5% contribution are presented. The sampling period in which the %C contribution was greatest is highlighted in bold for each taxon and the % contribution (% Con.) of each species to the dissimilarity (Av. Dis.) between the diet compositions in each sampling period is given. S07 = July 2007, W07 = December 2007, S08 = July 2008, W09 = February 2009

S07 (Av. Dis.: 53.15)				W07 (Av. Dis.: 38.34)			
Taxon	ANC	SAR	% Con.	Taxon	ANC	SAR	% Con.
Shrimp (mysis)	**5.12**	1.24	15.19	Shrimp (mysis)	**2.29**	0	12.55
Temora stylifera	2.46	**6.04**	14.10	*Temora stylifera*	1.29	**2.85**	9.34
Gastropod larvae	**3.56**	0.88	10.28	*Candacia* spp.	**2.40**	0.89	8.63
Crab (zoea)	**3.04**	0.29	8.6	*Calanus* spp.	**2.70**	3.57	7.84
Para-Clausocalanidae	0.84	**3.04**	6.99	*Centropages* spp.	7.48	**8.42**	6.85
Pteropods	**1.71**	0.54	5.37	Appendicularians	0.96	0	5.31
S08 (Av. Dis.: 55.37)				W09 (Av. Dis.: 66.80)			
Taxon	ANC	SAR	% Con.	Taxon	ANC	SAR	% Con.
Shrimp (mysis)	5.01	0.68	14.49	Shrimp (mysis)	**3.76**	0.39	20.36
Crab (zoea)	3.90	0.31	10.84	Para-Clausocalanidae	1.11	**2.73**	9.15
Centropages spp.	0	2.36	7.16	*Centropages* spp.	7.82	**8.84**	8.83
Cirriped larvae	0	2.13	6.40	*Calanus* spp.	0	**1.37**	7.71
Podon intermedius	0	1.78	5.37	Podon intermedius	0	**1.27**	6.93
Summers (Av. Dis.: 55.39)				Winters (Av. Dis.: 45.07)			
Taxon	ANC	SAR	% Con.	Taxon	ANC	SAR	% Con.
Shrimp (mysis)	**5.07**	0.96	14.59	Shrimp (mysis)	**3.27**	0.20	17.68
Crab (zoea)	**3.47**	0.30	9.67	*Calanus* spp.	0.90	**2.47**	11.63
Temora stylifera	4.13	**6.27**	8.89	*Centropages* spp.	7.70	**8.63**	8.18
Gastropod larvae	**1.97**	0.44	6.11	*Temora stylifera*	1.02	**1.43**	7.75
Centropages spp.	0.88	**2.66**	6.02	Para-Clausocalanidae	1.36	**1.93**	5.47
Cirriped larvae	0.12	**1.80**	5.12	*Candacia* spp.	**0.80**	0.64	5.16

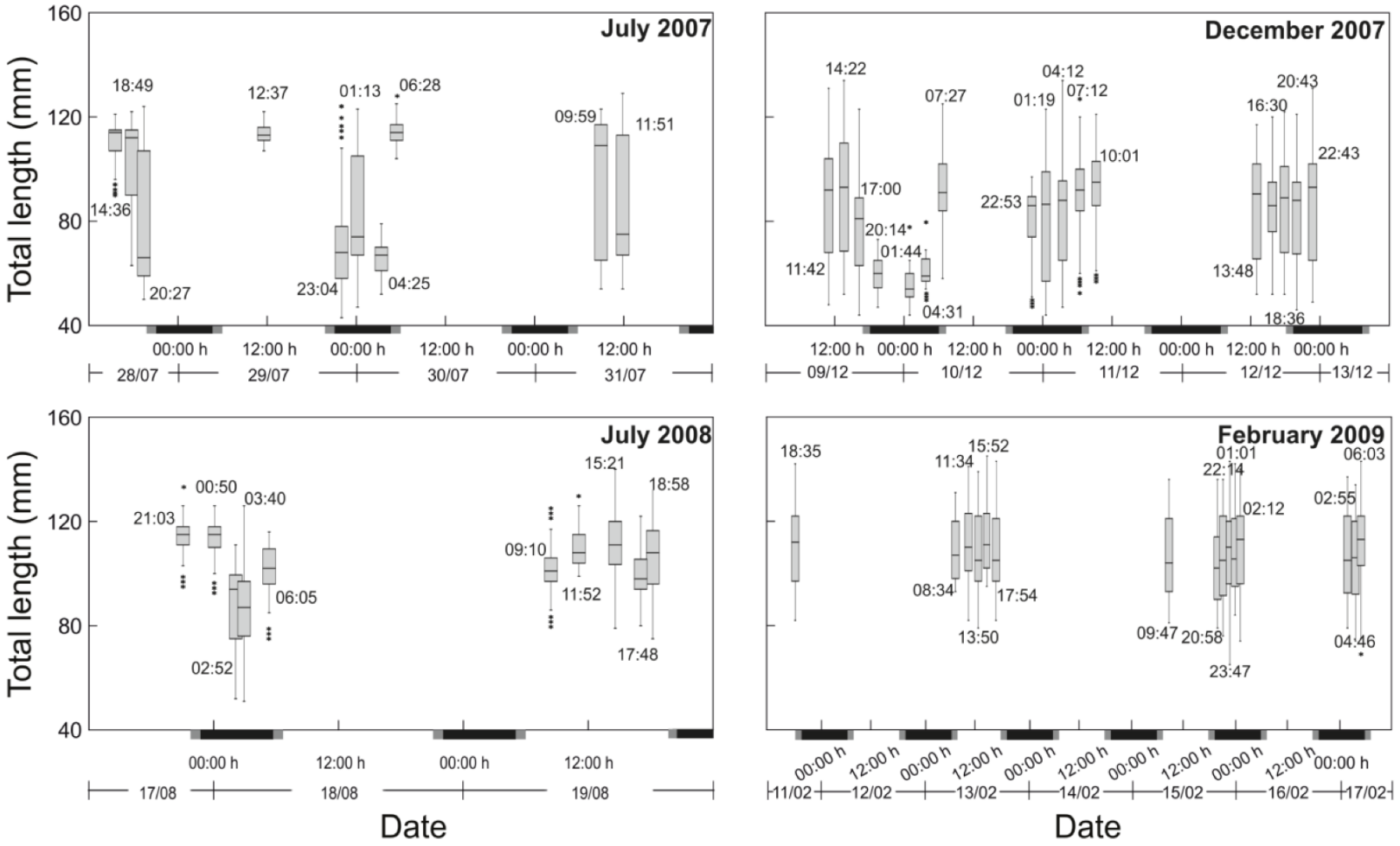

Fig. S1. *Engraulis encrasicolus.* Boxplots of anchovy length for all hauls performed in each sampling period. Boxes represent inter-quartile ranges; internal horizontal bars represent the median; whiskers represent 1.5× the interquartile range, and asterisks are given for outliers. Mean sampling time is also indicated. Nautical twilight (grey bar) and nighttime (black bar) are also shown on the bottom axes