

The following supplement accompanies the article

Traits structure copepod niches in the North Atlantic and Southern Ocean

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Table S1. A list of the 17 (*M. lucens* appears in both databases) species with evidence of diapausing behaviour. Shown here is the principal stage that undergoes diapause, the location of the observation, the reference and a short note on the observation encountered.

Species	Stage	Location	References	Observation
<i>Acartia longiremis</i>	CV (female)	North Sea	Norrbin 2001	Females remain in an active diapause state with a resting reproductive system from September to January.
<i>Calanoides acutus</i>	CIV - females (adult)	Antarctic (Weddell Sea)	Bathmann et al., 1993	Found to hibernate below the T max in the Weddell Sea down to 2000m.
	CV (female)	Antarctic	Drits et al., 1994	Female CV show evidence of hibernation in the region of 4-5 months
<i>Calanoides carinatus</i>	CV	Atlantic	Arashkevich et al., 1996	Surface CVs with a high lipid stock descended into deeper waters reducing respiration rates forming a diapausing stock.
	CV	Benguela Current	Auel et al., 2005	Results show a 96% metabolic reduction of deep living, diapausing CV individuals.
<i>Calanus australis</i>	CV	Black Sea, Pacific	Williams-Howze, 1997 (pg 269)	Personal communication from E.G Araskevich
<i>Calanus finmarchicus</i>	CIV-CV	Atlantic (Norway to Gulf of Maine)	Numerous resources (e.g. - Johnson et al., 2007)	Evidence of hibernation for this species is quite widespread for multiple areas of the North Atlantic. Johnson et al., gives a good overview of these as well as potential drivers of diapausing behaviour.
<i>Calanus glacialis</i>	CIV-CV	Arctic	Numerous resources (e.g. - Falk-Petersen et al., 2009)	Together with <i>C. hyperboreus</i> there are numerous studies that highlight the diapause and overwintering behaviour of this species. Falk Petersen et al., 2009 & references within highlight much of this
<i>Calanus helgolandicus</i>	CIV-CV	Atlantic (Norway, Iceland)	Wilson et al., 2015	Evidence of reduced metabolic rates and higher lipid stores were found for this species. However the resting stage time was much less than <i>C. finmarchicus</i> (~2 months).
<i>Calanus hyperboreus</i>	CIV-CV	Arctic	Numerous resources (e.g. - Falk-Petersen et al., 2009)	Evidence of hibernation for this species is quite widespread for multiple areas of the North Atlantic. Johnson et al., gives a good overview of these as well as potential drivers of diapausing behaviour.

<i>Calanus propinquus</i>	CIII-CV CV	Antarctic (Weddell Sea)	Bathmann et al., 1993 Drits et al., 1993	These stages found to overwinter in the Weddell Gyre with some CIII stages in active feeding state remaining at surface. Calculations of respiration rates and lipid reserves of CV show that these species have enough reserves to overwinter up to 8 months without any further energy sources Strong regional variation in diapause for this species with a biphasic winter distribution (i.e. - deep water diapause and shallow water active). Reduced feeding with reduced metabolism that is chiefly sustained by lipid stores
<i>Calanus simillimus</i>	CIV-CV	Antarctic	Atkinson, 1991	
<i>Metridia longa</i>	CIV - females (adult)	Bering Sea (Norway)	Hopkins et al., 1984 Sargent & Falk Petersen 1988	
<i>Metridia lucens (Pacifica)</i>	CIV - females (adult)	Japan	Hirikawa and Imamura 1993	A distinct resting stage of CV for <i>Metridia lucens</i> (Pacifica) lasting 8 months was observed for the population in this area.
<i>Neocalanus tonsus</i>	CIV-CV	New Zealand	Milleret al., 1999	Deep-water resting populations as well as surface-active feeding individuals were found. No significant genetic variation suggests ecological variants with different reproductive strategies are present. Potential overwintering stocks in the North Sea - Not true diapause
<i>Para/pseudocalanus</i>	CI-CV	North Sea	Connover 1988 Colebrook 1982	
<i>Rhincalanus gigas</i>	CI-CIII CV	Weddell Sea	Bathmann et al., 1993	Found to hibernate near the T max in the Warm Deep Water in the Weddell Sea over two consecutive years
<i>Rhincalanus nasutus</i>	CV	California Current System	Ohman et al., 1998	Species shows metabolic decreases and increased lipid stores during winter. However the overall finding is equivocal as to whether the species undergoes true diapause.
<i>Subeucalanus crassus</i>	CV	Indian Ocean	Kasyi, 2006	Evidence of spring reproduction with a diapause resting strategy for CV females

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Table S2 – Showing the 88 copepod taxa retained for the MaxEnt analysis including the functional trait assignment including dietary and feeding strategies, mean body length and diapause life history strategy. Also shown are the number of observations available from all grid cell/month/year combinations for the North Atlantic and Southern Ocean and the training AUC for the full model.

North Atlantic

Species	Dietary strategy	Feeding strategy	Body length (mm)	Diapause	Observations	AUC
<i>Parapontella brevicornis</i>	Omnivore	Mixed	1.60	Non Diapause	51	0.995
<i>Tortanus discaudatus</i>	Herbivore	Filter	2.85	Non Diapause	62	0.993
<i>Paracandacia bispinosa</i>	Carnivore	Cruise	2.16	Non Diapause	32	0.989
<i>Candacia pachydactyla</i>	Carnivore	Cruise	2.50	Non Diapause	79	0.985
<i>Labidocera wollastoni</i>	Omnivore	Filter	2.20	Non Diapause	906	0.984
<i>Undinula vulgaris</i>	Carnivore	Cruise	2.16	Non Diapause	147	0.982
<i>Candacia ethiopica</i>	Carnivore	Cruise	2.15	Non Diapause	208	0.979
<i>Acartia danae</i>	Herbivore	Mixed	1.30	Non Diapause	39	0.978
<i>Isias clavipes</i>	Omnivore	Cruise	1.25	Non Diapause	372	0.975
<i>Candacia bipinnata</i>	Carnivore	Cruise	2.35	Non Diapause	88	0.969
<i>Euchaeta media</i>	Carnivore	Filter	2.69	Non Diapause	49	0.967
<i>Scolecithrix danae</i>	Herbivore	Filter	2.20	Non Diapause	324	0.967
<i>Temora stylifera</i>	Herbivore	Filter	1.47	Non Diapause	190	0.965
<i>Paracandacia simplex</i>	Carnivore	Cruise	2.32	Non Diapause	116	0.964
<i>Centropages violaceus</i>	Omnivore	Mixed	1.92	Non Diapause	94	0.963
<i>Euchaeta marina</i>	Carnivore	Filter	2.61	Non Diapause	304	0.962
<i>Centropages chierchiae</i>	Omnivore	Mixed	2.26	Non Diapause	510	0.956
<i>Calanoides carinatus</i>	Herbivore	Filter	2.50	Diapause	1213	0.949
<i>Rhincalanus cornutus</i>	Herbivore	Filter	2.81	Non Diapause	36	0.947
<i>Calanus glacialis</i>	Herbivore	Filter	3.60	Diapause	1811	0.942
<i>Paraeuchaeta gracilis</i>	Carnivore	Cruise	5.05	Non Diapause	91	0.941
<i>Pleuromamma piseki</i>	Omnivore	Filter	2.40	Non Diapause	1291	0.927
<i>Acartia longiremis</i>	Herbivore	Mixed	0.98	Diapause	57	0.925
<i>Metridia longa</i>	Omnivore	Filter	3.59	Diapause	2312	0.924
<i>Centropages bradyi</i>	Omnivore	Mixed	2.00	Non Diapause	566	0.919
<i>Pleuromamma xiphias</i>	Omnivore	Filter	3.76	Non Diapause	668	0.911

<i>Heterorhabdus norvegicus</i>	Carnivore	Cruise	3.40	Non Diapause	399	0.909
<i>Paraeuchaeta hebes</i>	Carnivore	Cruise	2.26	Non Diapause	3182	0.905
<i>Undeuchaeta major</i>	Carnivore	Cruise	4.73	Non Diapause	92	0.904
<i>Eucalanus hyalinus</i>	Omnivore	Filter	5.40	Non Diapause	266	0.893
<i>Microcalanus</i> spp.	Herbivore	Filter	0.57	Non Diapause	33	0.891
<i>Lucicutia</i> spp.	Herbivore	Filter	2.00	Non Diapause	234	0.884
<i>Rhincalanus nasutus</i>	Herbivore	Filter	4.07	Diapause	1081	0.881
<i>Ctenocalanus vanus</i>	Herbivore	Filter	1.16	Non Diapause	226	0.879
<i>Subeucalanus crassus</i>	Herbivore	Filter	4.60	Diapause	799	0.878
<i>Anomalocera patersoni</i>	Omnivore	Filter	3.00	Non Diapause	496	0.877
<i>Nannocalanus minor</i>	Herbivore	Filter	1.74	Non Diapause	3295	0.875
<i>Pleuromamma abdominalis</i>	Omnivore	Filter	3.45	Non Diapause	2465	0.869
<i>Mecynocera clausi</i>	Herbivore	Filter	1.29	Non Diapause	513	0.869
<i>Temora longicornis</i>	Herbivore	Filter	1.37	Non Diapause	17019	0.868
<i>Neocalanus gracilis</i>	Herbivore	Filter	2.40	Non Diapause	2206	0.860
<i>Heterorhabdus papilliger</i>	Carnivore	Cruise	2.66	Non Diapause	436	0.858
<i>Mesocalanus tenuicornis</i>	Herbivore	Filter	1.80	Non Diapause	738	0.849
<i>Paraeuchaeta norvegica</i>	Carnivore	Cruise	5.45	Non Diapause	10561	0.845
<i>Euchaeta acuta</i>	Carnivore	Filter	2.94	Non Diapause	1952	0.844
<i>Undeuchaeta plumosa</i>	Carnivore	Cruise	4.64	Non Diapause	2018	0.839
<i>Pleuromamma gracilis</i>	Omnivore	Filter	2.00	Non Diapause	4204	0.838
<i>Pleuromamma borealis</i>	Omnivore	Filter	2.25	Non Diapause	5201	0.829
<i>Candacia armata</i>	Carnivore	Cruise	2.50	Non Diapause	5599	0.822
<i>Centropages typicus</i>	Omnivore	Mixed	1.60	Non Diapause	16839	0.819
<i>Clausocalanus</i> spp.	Herbivore	Cruise	1.67	Non Diapause	7230	0.812
<i>Scolecithricella</i> spp.	Herbivore	Filter	1.05	Non Diapause	817	0.811
<i>Euchirella rostrata</i>	Omnivore	Cruise	4.70	Non Diapause	1314	0.808
<i>Centropages hamatus</i>	Omnivore	Mixed	1.13	Non Diapause	4513	0.805
<i>Acartia clausii</i>	Herbivore	Mixed	0.87	Non Diapause	30723	0.801
<i>Pleuromamma robusta</i>	Omnivore	Filter	3.70	Non Diapause	6427	0.800
<i>Pseudocalanus</i> spp.	Herbivore	Filter	1.77	Non Diapause	17932	0.784
<i>Labidocera aestiva</i>	Omnivore	Filter	1.75	Non Diapause	42	0.783

<i>Calanus helgolandicus</i>	Herbivore	Filter	2.90	Diapause	32804	0.783
<i>Calanus finmarchicus</i>	Herbivore	Filter	2.70	Diapause	50282	0.730
<i>Metridia lucens</i>	Omnivore	Filter	2.01	Diapause	25514	0.716
<i>Calanus hyperboreus</i>	Herbivore	Filter	5.30	Diapause	1306	0.688
Para <i>Pseudocalanus</i>	Herbivore	Filter	1.36	Diapause	49681	0.670
Southern Ocean						
Species	Dietary strategy	Feeding strategy	Body length (mm)	Diapause	Observations	AUC
<i>Calanus australis</i>	Herbivore	Filter	2.50	Diapause	66	0.990
<i>Pleuromamma borealis</i>	Omnivore	Filter	1.78	Non Diapause	101	0.978
<i>Mecynocera clausi</i>	Herbivore	Filter	1.29	Non Diapause	55	0.973
<i>Paraeuchaeta exigua</i>	Carnivore	Cruise	6.10	Non Diapause	189	0.950
<i>Calocalanus</i> spp.	Herbivore	Filter	0.90	Non Diapause	78	0.947
<i>Haloptilus oxycephalus</i>	Carnivore	Cruise	3.50	Non Diapause	149	0.925
<i>Scolecithricella minor</i>	Herbivore	Filter	1.40	Non Diapause	33	0.914
<i>Pleuromamma robusta</i>	Omnivore	Filter	3.70	Non Diapause	257	0.904
<i>Ctenocalanus</i> spp.	Herbivore	Filter	1.16	Non Diapause	2094	0.884
<i>Neocalanus tonsus</i>	Omnivore	Filter	3.19	Diapause	857	0.884
<i>Subeucalanus longiceps</i>	Herbivore	Filter	3.86	Non Diapause	278	0.875
<i>Heterorhabdus austrinus</i>	Carnivore	Cruise	4.10	Non Diapause	137	0.854
<i>Calanus propinquus</i>	Herbivore	Filter	4.75	Diapause	540	0.839
<i>Metridia gerlachei</i>	Omnivore	Filter	4.30	Non Diapause	202	0.827
<i>Candacia maxima</i>	Carnivore	Cruise	3.20	Non Diapause	202	0.824
<i>Paraeuchaeta antarctica</i>	Carnivore	Cruise	6.51	Non Diapause	159	0.818
<i>Pleuromamma piseki</i>	Omnivore	Filter	2.40	Non Diapause	33	0.757
<i>Calanoides acutus</i>	Herbivore	Filter	4.60	Diapause	1647	0.746
<i>Rhincalanus gigas</i>	Herbivore	Filter	6.83	Diapause	1314	0.735
<i>Metridia lucens</i>	Omnivore	Filter	2.01	Diapause	1097	0.698
<i>Calanus simillimus</i>	Herbivore	Filter	3.10	Diapause	3787	0.649
<i>Clausocalanus brevipes</i>	Herbivore	Cruise	1.62	Non Diapause	2564	0.645
<i>Euchirella rostromagna</i>	Omnivore	Mixed	5.40	Non Diapause	55	0.636
<i>Clausocalanus laticeps</i>	Herbivore	Cruise	1.67	Non Diapause	2288	0.631