Supplementary Material for 'New insights into the Weddell Sea ecosystem applying a network approach'

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Equations for calculating species properties

We used the estimation of the interaction strength as the weighted property for the species of the Weddell Sea food web. The main equation to estimate the interaction strength IS was:

$$IS = \alpha X_R \frac{m_R}{m_C}$$

where α is the search rate, X_R is the resource density, and m_R and m_C are the body mass for the resource and the consumer, respectively (Pawar, Dell, and Van M. Savage 2012).

As unweighted properties we calculated degree, trophic level and trophic similarity. The degree k is simply the total number of feeding links in which the species participates. It was calculated as:

$$L = \sum_{i=1}^{S} k_i$$

where L is the total number of feeding links for the i^{th} species in the food web; here denoted as k_i. The trophic level refers to a species' vertical position in the food web, relative to the primary producers that support the community. Species that do not consume any other species in the web are primary producers or other basal resources; species with no predators are top predators; those with both predators and prey are intermediate consumers. Trophic levels TP were calculated for every species based on its position in the food web using the "prey-averaged technique":

$$TP_i = \frac{\sum_j TP_j}{n_i} + 1$$

where n_i is the total number of prey taxa consumed by taxon i, and TP_j represents the trophic position of all prey items j of taxon i (**Thompson2007?**). The trophic similarity TS between every pair of species in the food web was calculated using the following algorithm:

$$TS = \frac{c}{a + b + c}$$

where c is the number of predators and prey common to the two species, a is the number of predators and prey unique to one species, and b is the number of predators and prey unique to the other species. When the two species have the same set of predators and prey, $TS = 1$; when the two species have no common predators or common prey, $TS = 0$ (Martinez 1991).

Table S1 shows the mentioned properties for every species of the Weddell Sea food web.

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag

## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

TrophicSpecies	IS_mean	TotalDegree	TL	meanTrophicSimil
Actinocyclus actinochilus	0e+00	81	1.000	0.2017
Actinocyclus spiritus	0e+00	81	1.000	0.2017
Actinocyclus utricularis	0e+00	81	1.000	0.2017
Azpeitia tabularis	0e+00	81	1.000	0.2017
Banquisia belgicae	0e+00	81	1.000	0.2017
Chaetoceros bulbosum	0e+00	81	1.000	0.2017
Chaetoceros concavicornis	0e+00	81	1.000	0.2017
Chaetoceros criophilum	0e+00	81	1.000	0.2017
Chaetoceros dichaeta	0e+00	81	1.000	0.2017
Chaetoceros flexuosum	0e+00	81	1.000	0.2017
Chaetoceros neglectum	0e+00	81	1.000	0.2017
Chaetoceros pelagicus	0e+00	81	1.000	0.2017
Corethron criophilum	0e+00	81	1.000	0.2017
Coscinodiscus oculoides	0e+00	81	1.000	0.2017
Eucampia antarctica	0e+00	81	1.000	0.2017
Fragilariopsis curta	0e+00	81	1.000	0.2017
Fragilariopsis cylindrus	0e+00	81	1.000	0.2017
Fragilariopsis kerguelensis	0e+00	81	1.000	0.2017
Fragilariopsis linearis	0e+00	81	1.000	0.2017
Fragilariopsis nana	0e+00	81	1.000	0.2017
Fragilariopsis obliquecostata	0e+00	81	1.000	0.2017
Fragilariopsis pseudonana	0e+00	81	1.000	0.2017
Fragilariopsis rhombica	0e+00	81	1.000	0.2017
Fragilariopsis ritscheri	0e+00	81	1.000	0.2017
Fragilariopsis separanda	0e+00	81	1.000	0.2017
Fragilariopsis sublinearis	0e+00	81	1.000	0.2017
Fragilariopsis vanheurckii	0e+00	81	1.000	0.2017
Manguinea fusiformis	0e+00	81	1.000	0.2017
Manguinea rigida	0e+00	81	1.000	0.2017
Navicula glaciei	0e+00	81	1.000	0.2017
Navicula schefterae	0e+00	81	1.000	0.2017
Nitzschia kerguelensis	0e+00	81	1.000	0.2017
Nitzschia lecointei	0e+00	81	1.000	0.2017
Nitzschia neglecta	0e+00	81	1.000	0.2017
Odontella weissflogii	0e+00	81	1.000	0.2017
Porosira glacialis	0e+00	81	1.000	0.2017
Porosira pseudodenticulata	0e+00	81	1.000	0.2017
Proboscia alata	0e+00	81	1.000	0.2017
Proboscia inermi	0e+00	81	1.000	0.2017
Proboscia truncata	0e+00	81	1.000	0.2017
Pseudo-Nitzschia heimii	0e+00	81	1.000	0.2017
Pseudo-Nitzschia liniola	0e+00	81	1.000	0.2017
Pseudo-Nitzschia prolongatoides	0e+00	81	1.000	0.2017

TrophicSpecies	IS_mean	TotalDegree	TL	meanTrophicSimil
Pseudo-Nitzschia subcurvata	0e+00	81	1.000	0.2017
Rhizosolenia antennata	0e+00	81	1.000	0.2017
Stellarima microtrias	0e+00	81	1.000	0.2017
Thalassiosira australis	0e+00	81	1.000	0.2017
Thalassiosira frenguelliopsis	0e+00	81	1.000	0.2017
Thalassiosira gracilis	0e+00	81	1.000	0.2017
Thalassiosira gracilis expecta	0e+00	81	1.000	0.2017
Thalassiosira gravida	0e+00	81	1.000	0.2017
Thalassiosira lentiginosa	0e+00	81	1.000	0.2017
Thalassiosira ritscheri	0e+00	81	1.000	0.2017
Thalassiosira trifulta	0e+00	81	1.000	0.2017
Thalassiosira tumida	0e+00	81	1.000	0.2017
Trichotoxon reinboldii	0e+00	81	1.000	0.2017
Phytodetritus	0e+00	226	1.000	0.0940
Sediment	0e+00	57	1.000	0.0637
Dictyocha speculum	0e+00	30	1.000	0.1096
Phaeocystis antarctica	0e+00	30	1.000	0.1096
Silicioflagellata	0e+00	30	1.000	0.1096
Bodo saltans	0e+00	32	3.000	0.1079
Neogloboquadriana pachyderma	0e+00	93	2.000	0.1338
Pelagobia longicirrata	0e+00	137	2.121	0.1317
Rhynchonereella bongraini	0e+00	84	2.121	0.1143
Laetmonice producta	0e+00	136	3.945	0.1781
Harmothoe spinosa	0e+00	212	3.723	0.1458
Harmothoe crosetensis	0e+00	170	3.733	0.1544
Harmotoe hartmanae	0e+00	170	3.733	0.1544
Polyeunoa laevis	0e+00	111	3.815	0.1676
Barrukia cristata	0e+00	99	3.706	0.1504
Eulagisca gigantea	0e+00	142	3.798	0.1668
Eunoe spica	0e+00	214	4.037	0.1507
Eunoe hartmanae	0e+00	152	3.778	0.1667
Eunoe spica spicoides	0e+00	249	3.936	0.1416
Vanadis antarctica	0e+00	140	2.341	0.1655
Pista spinifera	0e+00	66	2.000	0.1517
Phyllocomus crocea	0e+00	66	2.000	0.1517
Terebella ehlersi	0e+00	66	2.000	0.1517
Eucranta mollis	0e+00	68	2.000	0.1576
Cinachyra antarctica	0e+00	44	2.000	0.1573
Cinachyra barbata	0e+00	43	2.000	0.1573
Bathydorus spinosus	0e+00	43	2.000	0.1573
Iophon radiatus	0e+00	43	2.000	0.1573
Kirkpatrickia variolosa	0e+00	46	2.000	0.1517
Rossella racovitzae	0e+00	48	2.000	0.1540
Stylocordyla borealis	0e+00	43	2.000	0.1573
Homaxinella balfourensis	0e+00	47	2.000	0.1552
Scolymastra joubini	0e+00	44	2.000	0.1560
Latrunculia apicalis	0e+00	43	2.000	0.1573
Latrunculia brevis	0e+00	43	2.000	0.1573
Tetilla leptoderma	0e+00	49	2.000	0.1519
Haliclona dancoi	0e+00	47	2.000	0.1506
Mycale acerata	0e+00	44	2.000	0.1560
Rossella antarctica	0e+00	43	2.000	0.1573

TrophicSpecies	IS_mean	TotalDegree	TL	meanTrophicSimil
Rossella tarenja	0e+00	43	2.000	0.1573
Haliclona tenella	0e+00	47	2.000	0.1506
Clathria pauper	0e+00	43	2.000	0.1573
Calyx arcuarius	0e+00	44	2.000	0.1560
Isodyctia toxophila	0e+00	43	2.000	0.1573
Isodyctia cavicornuta	0e+00	43	2.000	0.1573
Isodyctia steifera	0e+00	44	2.000	0.1560
Axociella nidificata	0e+00	43	2.000	0.1573
Rossella nuda	0e+00	45	2.000	0.1594
Tentorium papillatum	0e+00	43	2.000	0.1573
Tentorium semisuberites	0e+00	43	2.000	0.1573
Tedania oxeata	0e+00	43	2.000	0.1573
Tedania tantulata	0e+00	43	2.000	0.1573
Tedania vanhoeffeni	0e+00	43	2.000	0.1573
Phorbas areolatus	0e+00	43	2.000	0.1573
Phorbas glaberrima	0e+00	43	2.000	0.1573
Polymastia invaginata	0e+00	44	2.000	0.1560
Polymastia isidis	0e+00	43	2.000	0.1573
Anoxycalyx joubini	0e+00	48	2.000	0.1531
Mesothuria lactea	0e+00	17	2.000	0.1109
Achlyonice violaecuspidata	0e+00	17	2.000	0.1109
Bathyplotes gourdoni	0e+00	17	2.000	0.1109
Bathyplotes bongraini	0e+00	17	2.000	0.1109
Scotoplanes globosa	0e+00	17	2.000	0.1109
Molpadia musculus	0e+00	17	2.000	0.1109
Ypsilocucumis turricata	0e+00	17	2.000	0.1109
Psolidium incertum	0e+00	17	2.000	0.1109
Trachythyone parva	0e+00	17	2.000	0.1109
Laetmogone wyvillethompsoni	0e+00	17	2.000	0.1109
Pseudostichopus mollis	0e+00	17	2.000	0.1109
Pseudostichopus villosus	0e+00	17	2.000	0.1109
Elpidia glacialis	0e+00	17	2.000	0.1109
Chiridota weddellensis	0e+00	17	2.000	0.1109
Ekmocucumis steineni	0e+00	16	2.000	0.1097
Ekmocucumis turqueti	0e+00	16	2.000	0.1097
Abyssocucumis liouvillei	0e+00	16	2.000	0.1097
Psolus dubiosus	0e+00	16	2.000	0.1097
Psolus charcoti	0e+00	16	2.000	0.1097
Psolus antarcticus	0e+00	16	2.000	0.1097
Echinopsolus acanthocola	0e+00	16	2.000	0.1097
Ekmocucumis turqueti turqueti	0e+00	16	2.000	0.1097
Taeniogyrus contortus	0e+00	20	2.000	0.1099
Ampelisca richardsoni	0e+00	108	2.000	0.1590
Alexandrella mixta	0e+00	59	3.924	0.1423
Parschisturella ceruviata	0e+00	45	2.000	0.1391
Paramoera walkeri	0e+00	60	3.924	0.1432
Maxilliphimedia longipes	0e+00	60	3.262	0.1359
Gnathiphimedia mandibularis	0e+00	102	3.000	0.1151
Echiniphimedia hodgsoni	0e+00	83	2.971	0.1287
Iphimediella cyclogena	0e+00	86	3.435	0.1149
Momoculodes scabriculosus	0e+00	49	2.000	0.1444
Pseudorchomene coatsi	0e+00	49	2.000	0.1444

TrophicSpecies	IS_mean	TotalDegree	TL	meanTrophicSimil
Haplocheira plumosa	0e+00	115	2.075	0.1564
Oradarea edentata	0e+00	115	2.076	0.1537
Djerboa furcipes	0e+00	116	2.076	0.1536
Ophioperla koehleri	0e+00	21	2.000	0.0748
Ophionotus victoriae	0e+00	217	2.974	0.1473
Ophioceres incipiens	0e+00	154	2.692	0.1196
Ophiurolepis brevirima	0e+00	223	3.009	0.1431
Ophiurolepis gelida	0e+00	206	2.989	0.1396
Ophiosparte gigas	0e+00	301	3.431	0.1552
Ophioperla ludwigi	0e+00	97	3.362	0.1136
Ophiacantha antarctica	0e+00	90	2.157	0.1248
Astrotoma agassizii	0e+00	223	2.856	0.1235
Astrochlamys bruneus	0e+00	37	3.525	0.0945
Gorgonocephalus chiliensis	0e+00	25	3.167	0.0802
Ceratoserolis meridionalis	0e+00	90	3.986	0.1572
Frontoserolis bouvieri	0e+00	90	3.986	0.1572
Natatolana obtusata	0e+00	31	2.000	0.1158
Natatolana oculata	0e+00	30	2.000	0.1166
Natatolana meridionalis	0e+00	31	2.000	0.1173
Munna globicauda	0e+00	30	2.000	0.1166
Serolella bouveri	0e+00	90	3.986	0.1572
Serolis polita	0e+00	90	3.986	0.1572
Gnathia calva	0e+00	48	3.560	0.1261
Austrosignum grande	0e+00	89	2.000	0.1377
Aega antarctica	0e+00	30	2.000	0.1166
Arcturidae	0e+00	30	2.000	0.1166
Silicularia rosea	0e+00	118	2.368	0.1428
Tubularia ralphii	0e+00	53	3.440	0.1220
Oswaldella antarctica	0e+00	93	2.000	0.1278
Monocaulus parvula	0e+00	115	2.367	0.1454
Primnoisis antarctica	0e+00	39	3.525	0.1173
Gersemia antarctica	0e+00	87	2.077	0.1317
Clavularia frankiliana	0e+00	101	2.352	0.1376
Primnoella	0e+00	23	2.000	0.1019
Ainigmaptilon antarcticus	0e+00	23	2.000	0.1019
Armadillogorgia cyathella	0e+00	23	2.000	0.1019
Alcyonium antarcticum	0e+00	23	1.000	0.0957
Anthomastus bathyproctus	0e+00	84	2.021	0.1328
Alacia hettacra	0e+00	124	2.075	0.1302
Alacia belgicae	0e+00	124	2.075	0.1302
Metaconchoecia isocheira	0e+00	124	2.075	0.1302
Boroecia antipoda	0e+00	124	2.075	0.1302
Cibicides refulgens	0e+00	89	2.000	0.1292
Globocassidulina crassa	0e+00	89	2.000	0.1292
Lenticulina antarctica	0e+00	90	2.000	0.1299
Pentanymphon antarcticum	0e+00	140	3.931	0.0992
Ammothea carolinensis	0e+00	135	3.931	0.0992
Colossendeis scotti	0e+00	135	3.931	0.0992
Nymphon gracillimum	0e+00	135	3.931	0.0992
Flustra angusta	0e+00	31	2.000	0.1253
Camptoplites tricornis	0e+00	31	2.000	0.1253
Nematoflustra flagellata	0e+00	31	2.000	0.1253

TrophicSpecies	IS_mean	TotalDegree	TL	meanTrophicSimil
Austroflustra vulgaris	0e+00	31	2.000	0.1253
Melicerita obliqua	0e+00	31	2.000	0.1253
Systenopora contracta	0e+00	31	2.000	0.1253
Flustra antarctica	0e+00	31	2.000	0.1253
Fasciculiporoides ramosa	0e+00	31	2.000	0.1253
Reteporella hippocrepis	0e+00	31	2.000	0.1253
Lageneschara lyrulata	0e+00	31	2.000	0.1253
Isoschizoporella tricuspis	0e+00	31	2.000	0.1253
Caulastraea curvata	0e+00	31	2.000	0.1253
Chondriovelum adeliense	0e+00	31	2.000	0.1253
Bostrychopora dentata	0e+00	31	2.000	0.1253
Liothyrella uva	0e+00	2	2.000	0.0411
Magellania joubini	0e+00	2	2.000	0.0411
Magellania fragilis	0e+00	2	2.000	0.0411
Crania lecointei	0e+00	2	2.000	0.0411
Compsothyris racovitzae	0e+00	2	2.000	0.0411
Liothyrella uva antarctica	0e+00	2	2.000	0.0411
Glyptonotus antarcticus	0e+00	121	3.881	0.1166
Cassidulinoides parkerianus	0e+00	86	2.000	0.1240
Nototanais antarcticus	0e+00	70	2.000	0.1047
Peraeospinosus pushkini	0e+00	104	2.358	0.1015
Nototanais dimorphus	0e+00	69	2.000	0.1042
Notaeolidia gigas	0e+00	28	3.896	0.1046
Austrodoris kerguelenensis	0e+00	36	3.000	0.0977
Trophon longstaffi	0e+00	34	3.000	0.0981
Tritonia antarctica	0e+00	28	2.500	0.1041
Aegires albus	0e+00	60	3.000	0.0921
Bathydoris clavigera	0e+00	46	3.165	0.1072
Tritoniella belli	0e+00	87	2.984	0.0854
Harpovoluta charcoti	0e+00	79	3.022	0.0888
Puncturella conica	0e+00	80	2.981	0.0927
Neobuccinum eatoni	0e+00	34	3.000	0.0999
Marseniopsis mollis	0e+00	28	3.000	0.1030
Marseniopsis conica	0e+00	28	3.000	0.1030
Parmaphorella mawsoni	0e+00	86	2.000	0.1284
Amauropsis rossiana	0e+00	30	3.318	0.1046
Newnesia antarctica	0e+00	28	2.000	0.1136
Falsimargarita gemma	0e+00	28	2.000	0.1136
Marginella ealesa	0e+00	28	2.000	0.1136
Pontiothauma ergata	0e+00	41	4.236	0.1165
Probuccinum tenuistriatum	0e+00	41	4.236	0.1165
Nacella concinna	0e+00	21	3.000	0.0834
Yolida eightsi	0e+00	37	2.000	0.1022
Acodontaster conspicuus	0e+00	13	3.000	0.0415
Acodontaster capitatus	0e+00	13	3.000	0.0415
Acodontaster hodgsoni	0e+00	13	3.000	0.0415
Bathybiaster loripes	0e+00	101	2.672	0.1306
Cuenotaster involutus	0e+00	8	2.000	0.0605
Diplasterias brucei	0e+00	29	3.834	0.0525
Luidiaster gerlachei	0e+00	18	3.763	0.0834
Labidiaster annulatus	0e+00	144	3.890	0.1276
Lophaster gaini	0e+00	12	3.000	0.0417

TrophicSpecies	IS_mean	TotalDegree	TL	meanTrophicSimil
Notasterias armata	0e+00	12	3.000	0.0417
Solaster dawsoni	0e+00	29	3.719	0.0789
Odontaster meridionalis	0e+00	41	2.971	0.0530
Odontaster validus	0e+00	234	3.300	0.1428
Kampylaster incurvatus	0e+00	7	2.000	0.0598
Cycethra verrucosa mawsoni	0e+00	7	2.000	0.0598
Notasterias stylophora	0e+00	12	3.000	0.0417
Notioceramus anomalus	0e+00	7	2.000	0.0598
Perknaster sladeni	0e+00	7	2.000	0.0598
Pteraster affinis aculeatus	0e+00	12	3.000	0.0417
Perknaster densus	0e+00	7	2.000	0.0598
Perknaster fuscus antarcticus	0e+00	10	2.667	0.0549
Macroptychaster accrescens	0e+00	46	3.799	0.0764
Lysasterias perrieri	0e+00	30	3.460	0.0880
Psilaster charcoti	0e+00	59	4.405	0.0822
Porania antarctica	0e+00	72	2.119	0.1075
Porania antarctica glabra	0e+00	72	2.119	0.1075
Sterechinus neumayeri	0e+00	141	2.676	0.1186
Sterechinus antarcticus	0e+00	121	2.469	0.1014
Cyclocardia astartoides	0e+00	18	2.000	0.0747
Laternula elliptica	0e+00	30	2.000	0.0944
Limopsis lillei	0e+00	29	2.000	0.0936
Limopsis marionensis	0e+00	29	2.000	0.0936
Lissarca notorcadensis	0e+00	32	2.000	0.0944
Propeleda longicaudata	0e+00	25	2.000	0.0735
Promachocrinus kerguelensis	0e+00	8	2.000	0.0546
Anthometra adriani	0e+00	7	2.000	0.0474
Molgula pedunculata	0e+00	5	2.000	0.0483
Ascidia challengeri	0e+00	5	2.000	0.0483
Corella eumyota	0e+00	5	2.000	0.0483
Aplidium vastum	0e+00	5	2.000	0.0483
Synoicum adareanum	0e+00	5	2.000	0.0483
Cnemidocarpa verrucosa	0e+00	7	2.000	0.0412
Sycozoa sigillinoides	0e+00	5	2.000	0.0483
Pyura bouvetensis	0e+00	5	2.000	0.0483
Pyura discoveryi	0e+00	5	2.000	0.0483
Pyura setosa	0e+00	5	2.000	0.0483
Pyura tunicata	0e+00	5	2.000	0.0483
Cephalodiscus	0e+00	4	2.000	0.0382
Cadulus dalli antarcticum	0e+00	6	2.000	0.0348
Fissidentalium majorinum	0e+00	6	2.000	0.0348
Urticinopsis antarctica	0e+00	27	3.758	0.0779
Isotealia antarctica	0e+00	74	2.213	0.1063
Edwardsia meridionalis	0e+00	75	2.149	0.1126
Isosicyonis alba	0e+00	75	2.149	0.1126
Eudorella splendida	0e+00	68	2.000	0.1020
Vaunthompsonia indermis	0e+00	68	2.000	0.1020
Camylaspis maculata	0e+00	66	2.000	0.0972
Diastylis mawsoni	0e+00	8	2.000	0.0444
Ekleptostylis debroyeri	0e+00	8	2.000	0.0444
Phascolion strombi	0e+00	2	2.000	0.0471
Golfingia nordenskojoeldi	0e+00	2	2.000	0.0471

TrophicSpecies	IS_mean	TotalDegree	TL	meanTrophicSimil
Golfingia mawsoni	0e+00	2	2.000	0.0471
Golfingia ohlini	0e+00	2	2.000	0.0471
Golfingia anderssoni	0e+00	2	2.000	0.0471
Golfingia margaritacea margaritacea	0e+00	2	2.000	0.0471
Alomasoma belyaevi	0e+00	2	2.000	0.0471
Echiurus antarcticus	0e+00	2	2.000	0.0471
Hamingia	0e+00	2	2.000	0.0471
Maxmuelleria faex	0e+00	2	2.000	0.0471
Nuttallochiton mirandus	0e+00	54	3.000	0.0429
Callochiton gaussi	0e+00	15	3.000	0.0118
Amphidinium hadai	0e+00	35	2.000	0.1070
Gyrodinium lachryama	0e+00	35	2.000	0.1070
Chaetoceros socialis	0e+00	81	1.000	0.2017
Cylindrotheca closterium	0e+00	81	1.000	0.2017
Thalassiosira antarctica	0e+00	81	1.000	0.2017
Parvicorbucula socialis	1e-04	91	2.000	0.1361
Rhincalanus gigas	0e+00	166	2.153	0.1345
Calanus propinquus	0e+00	165	2.153	0.1349
Calanoides acutus	0e+00	166	2.166	0.1358
Metridia gerlachei	0e+00	166	2.153	0.1343
Paraeuchaeta antarctica	0e+00	171	2.208	0.1354
Clione limacina	0e+00	51	3.869	0.0731
Clione antarctica	0e+00	56	2.580	0.0748
Clio pyramidata	0e+00	58	3.159	0.0884
Limacina helicina antarctica	0e+00	62	3.159	0.0921
Rhodalia miranda	0e+00	20	3.525	0.0648
Atolla wyvillei	0e+00	20	3.525	0.0648
Dimophyes arctica	0e+00	20	3.525	0.0648
Diphyes antarctica	0e+00	20	3.525	0.0648
Bargmannia	0e+00	56	3.329	0.0915
Euphausia crystallorophias	0e+00	132	2.076	0.1190
Euphausia frigida	0e+00	137	2.271	0.1189
Thysanoessa macrura	0e+00	145	2.408	0.1165
Euphausia superba	0e+00	163	2.271	0.1204
Pareledone charcoti	0e+00	83	4.571	0.1076
Pareledone antarctica	0e+00	107	4.412	0.1199
Artedidraco orianae	0e+00	52	3.759	0.1172
Artedidraco loennbergi	0e+00	133	3.881	0.1430
Artedidraco skottsbergi	0e+00	135	3.859	0.1380
Dolloidraco longedorsalis	0e+00	168	3.720	0.1498
Pogonophryne marmorata	0e+00	70	3.678	0.1185
Pogonophryne phyllopogon	0e+00	103	3.924	0.1452
Pogonophryne permitini	0e+00	104	3.934	0.1425
Pogonophryne scotti	0e+00	104	3.934	0.1425
Pogonophryne barsukovi	0e+00	104	3.934	0.1425
Cygnodraco mawsoni	0e+00	84	3.984	0.1394
Gerlachea australis	0e+00	72	3.926	0.1336
Gymnodraco acuticeps	0e+00	61	3.702	0.1181
Prionodraco evansii	0e+00	61	3.452	0.1151
Racovitzia glacialis	0e+00	53	3.542	0.1139
Chaenodraco wilsoni	1e-04	32	3.301	0.0910
Chionodraco hamatus	1e-04	42	3.815	0.1068

TrophicSpecies	IS_mean	TotalDegree	TL	meanTrophicSimil
Chionodraco myersi	1e-04	37	4.086	0.0941
Cryodraco antarcticus	1e-04	30	3.520	0.0894
Dacodraco hunteri	1e-04	65	4.798	0.1009
Pagetopsis maculatus	1e-04	37	4.086	0.0941
Aethotaxis mitopteryx	0e+00	109	3.884	0.1493
Dissostichus mawsoni	1e-04	87	4.118	0.1257
Trematomus eulepidotus	0e+00	71	3.641	0.1174
Trematomus lepidorhinus	0e+00	95	3.808	0.1227
Trematomus loennbergii	0e+00	133	4.108	0.1153
Trematomus nicolai	0e+00	113	3.849	0.1399
Trematomus pennellii	0e+00	192	4.045	0.1581
Trematomus scotti	0e+00	146	3.820	0.1527
Pleuragramma antarcticum	1e-04	69	3.577	0.0759
Notothenia marmorata	1e-04	44	4.092	0.0907
Notothenia coriiceps	0e+00	130	4.271	0.1261
Trematomus bernacchii	0e+00	118	3.616	0.1044
Trematomus hansoni	0e+00	109	4.355	0.1339
Macrourus holotrachys	1e-04	85	4.705	0.1115
Macrourus whitsoni	1e-04	92	4.546	0.1237
Electrona antarctica	0e+00	65	3.479	0.1047
Harpagifer antarcticus	0e+00	78	3.803	0.1023
Bathylagus antarcticus	0e+00	61	3.362	0.0727
Notolepis coatsi	0e+00	58	3.502	0.0733
Gymnoscopelus braueri	0e+00	62	3.525	0.0870
Gymnoscopelus opisthopterus	0e+00	54	3.401	0.0817
Gymnoscopelus nicholsi	0e+00	59	3.715	0.0871
Protomyctophum bolini	0e+00	61	3.441	0.0770
Pagetopsis macropterus	1e-04	76	4.635	0.1129
Muraenolepis marmoratus	1e-04	36	3.191	0.1041
Muraenolepis microps	0e+00	88	3.692	0.1332
Abyssorchomene rossi	0e+00	164	2.652	0.1559
Abyssorchomene plebs	0e+00	107	2.079	0.1586
Abyssorchomene nodimanus	0e+00	137	4.211	0.1300
Eusirus antarcticus	0e+00	53	3.167	0.1484
Eusirus perdentatus	0e+00	114	3.866	0.1707
Tryphosella murrayi	0e+00	96	3.879	0.1598
Waldeckia obesa	0e+00	197	3.519	0.1379
Epimeriella walkeri	0e+00	217	2.884	0.1480
Cyllopus lucasii	0e+00	165	2.394	0.1556
Hyperiella dilatata	0e+00	129	2.153	0.1569
Vibilia antarctica	0e+00	91	3.560	0.1418
Vibilia stebbingi	0e+00	90	3.560	0.1427
Hyperia macrocephala	0e+00	58	4.355	0.1349
Epimeria similis	0e+00	159	2.493	0.1483
Epimeria robusta	0e+00	90	3.461	0.1590
Epimeria macrodonta	0e+00	198	2.685	0.1452
Epimeria rubrieques	0e+00	85	3.470	0.1572
Epimeria georgiana	0e+00	139	2.532	0.1688
Melphidippa antarctica	0e+00	121	3.045	0.1190
Oediceroides emarginatus	0e+00	153	2.767	0.1655
Oediceroides calmani	0e+00	153	2.767	0.1655
Paraceradocus gibber	0e+00	151	2.802	0.1706

TrophicSpecies	IS_mean	TotalDegree	TL	meanTrophicSimil
Liljeborgia georgiana	0e+00	146	3.456	0.1527
Uristes gigas	0e+00	184	2.842	0.1609
Eurythenes gryllus	0e+00	210	3.528	0.1356
Bathypanoploea schellenbergi	0e+00	195	2.874	0.1463
Heterophoxus videns	0e+00	157	2.506	0.1534
Rhachotropis antarctica	0e+00	185	3.015	0.1760
Themisto gaudichaudii	0e+00	74	3.560	0.1497
Primno macropa	0e+00	74	3.560	0.1497
Eucopia australis	0e+00	105	2.360	0.1328
Euchaetomera antarcticus	0e+00	105	2.360	0.1328
Antarctomysis maxima	0e+00	105	2.360	0.1328
Conchoecia hettacra	0e+00	77	3.242	0.1193
Conchoecia antipoda	0e+00	135	2.330	0.1420
Eukrohnia hamata	0e+00	38	3.157	0.0748
Solmundella bitentaculata	0e+00	8	3.903	0.0199
Dipulmaris antarctica	0e+00	14	3.801	0.0402
Desmonema glaciale	0e+00	19	3.723	0.0583
Periphylla periphylla	0e+00	19	3.723	0.0583
Salpa thompsoni	0e+00	108	2.279	0.1027
Beroe cucumis	0e+00	18	3.332	0.0396
Lyrocteis flavopallidus	0e+00	28	3.603	0.0639
Callianira antarctica	0e+00	28	3.603	0.0639
Pachycara brachycephalum	0e+00	67	3.971	0.1320
Chorismus antarcticus	0e+00	213	3.144	0.1387
Champsocephalus gunnari	1e-04	46	3.720	0.0859
Notocrangon antarcticus	0e+00	178	2.878	0.1005
Nematocarcinus lanceopes	0e+00	90	2.394	0.1110
Psychroteuthis glacialis	1e-04	23	3.912	0.0542
Moroteuthis ingens	1e-04	46	4.039	0.0737
Alluroteuthis antarcticus	1e-04	19	4.253	0.0294
Galiteuthis glacialis	1e-04	30	3.256	0.0390
Kondakovia longimana	1e-04	25	3.256	0.0391
Gonatus antarcticus	1e-04	36	4.308	0.0459
Mesonychoteuthis hamiltoni	2e-04	29	4.411	0.0278
Martialia hyadesi	1e-04	33	4.518	0.0429
Pseudosagitta gazellae	0e+00	11	3.181	0.0287
Sagitta marri	0e+00	17	3.159	0.0478
Pseudosagitta maxima	0e+00	15	3.159	0.0445
Salpa gerlachei	0e+00	76	2.076	0.0893
Ihlea racovitzai	0e+00	76	2.076	0.0893
Arctocephalus gazella	1e-04	61	4.666	0.0933
Pygoscelis adeliae	1e-04	7	3.781	0.0264
Thalassoica antarctica	1e-04	19	4.319	0.0533
Halobaena caerulea	0e+00	22	4.252	0.0601
Lobodon carcinophaga	1e-04	28	4.239	0.0606
Hydrurga leptonyx	1e-04	67	4.716	0.0943
Mirounga leonina	1e-04	56	4.868	0.0800
Ommatophoca rossii	1e-04	56	4.868	0.0800
Leptonychotes weddelli	1e-04	59	4.859	0.0840
Balaenoptera acutorostrata	1e-04	29	3.738	0.0784
Ctenocidaris gigantea	0e+00	70	3.267	0.0706
Ctenocidaris spinosa	0e+00	75	3.250	0.0749

TrophicSpecies	IS_mean	TotalDegree	TL	meanTrophicSimil
Notocidaris mortenseni	0e+00	54	3.003	0.0464
Abatus curvidens	0e+00	2	2.000	0.0388
Abatus cavernosus	0e+00	2	2.000	0.0388
Abatus nimrodi	0e+00	2	2.000	0.0388
Abatus shackeltoni	0e+00	2	2.000	0.0388
Austrocidaris canaliculata	0e+00	25	3.774	0.0303
Aporocidaris milleri	0e+00	60	3.312	0.0746
Ctenocidaris perrieri	0e+00	68	3.273	0.0667
Ctenocidaris gilberti	0e+00	53	3.000	0.0418
Baseodiscus antarcticus	0e+00	90	3.534	0.0701
Lineus longifissus	0e+00	90	3.534	0.0701
Parborlasia corrugatus	0e+00	90	3.534	0.0701
Fulmarus glacialoides	1e-04	17	4.328	0.0524
Daption capense	1e-04	15	4.390	0.0509
Pagodroma nivea	0e+00	11	4.212	0.0455
Aphrodroma brevirostris	0e+00	11	4.204	0.0448
Macronectes halli	1e-04	11	4.944	0.0263
Macronectes giganteus	1e-04	16	4.305	0.0442
Procellaria aequinoctialis	0e+00	8	4.246	0.0257
Oceanites oceanicus	0e+00	8	4.070	0.0327
Sterna vittata	0e+00	2	3.875	0.0124
Sterna paradisaea	0e+00	7	4.035	0.0314
Pachyptila desolata	0e+00	33	4.229	0.0793
Aptenodytes forsteri	1e-04	53	4.777	0.0843
Balaenoptera musculus	1e-04	37	4.042	0.0815
Balaenoptera physalus	1e-04	37	4.042	0.0815
Physeter macrocephalus	1e-04	20	4.471	0.0484
Megaptera novaeangliae	1e-04	4	3.256	0.0240
Orcinus orca	2e-04	26	5.027	0.0371
Lagenorhynchus cruciger	1e-04	20	4.471	0.0484
Tursiops truncatus	1e-04	20	4.471	0.0484

Extinction simulations and stability

We performed extinction simulations, one at a time, for every species in the Weddell Sea food web. In order to assess the impact on the stability of the food web we statistically compared a stability index before and after performing the extinction. For this, we applied Quasi-Sign Stability QSS that calculates the proportion of matrices that are locally stable. These matrices are created by sampling the values of the community matrix (the Jacobian) from a uniform distribution, preserving the sign structure: positive for predators and negative for prey. This stability index was originally proposed by Allesina and Pascual (2008). We used the R package multiweb to calculate QSS and to test the QSS difference before and after performing the extinction (Saravia, 2019). Two functions were specifically created for these analyses: 'calc_QSS' and 'calc_QSS_extinction_dif'. For the QSS calculation we used a uniform distribution between 0 and maximum values given by the parameters negative, positive and self-damping, corresponding to the sign of interactions and self-limitation effect. Since we had estimated the interaction strength for each interaction of the Weddell Sea food web, the limits of the distribution were $negative * -x$,$positive * x$, $self - damping * x$, where x is the value of the strength for the interaction in question.

Table S2 shows the results for the QSS differences before and after performing extinction simulations for every species of the Weddell Sea food web.

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