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Supporting Information for

Trophic pathways of phytoplankton size classes through the zooplankton food-web over the spring transition period in the north-west Mediterranean Sea

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Introduction

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Figure S2. Matrix plot of potential POM food sources for zooplankton groups 1 to 8 with posterior probability distributions for each of the three POM size fractions and correlations between contributions for pairs of potential food sources.

Table S1. Percentage similarity analysis (SIMPER) of taxonomic groups within and among Winter, SpringLB and SpringHB regions during Leg 1 and Leg 2 of the DEWEX program. SIMPER analysis was performed on $\log_{10}(x+1)$ transformed abundance data, related using the Bray-Curtis similarity index. The analyses were performed using PRIMER 6 [*Clarke and Warwick*, 2001]. The cut off for low contributions: 90.00%

Tables S1.1. Similarity within Winter zooplankton stations (average similarity = 80.06 %)

Taxon	Ave. $\log_{10}$(Abun.+1)	Ave. Similarity	Sim/SD	% contribution to similarity	Cumulative % similarity
Poecilostomatoidea	6.58	10.94	7.88	13.66	13.66
Nauplii	7.05	10.75	8.14	13.43	27.10
Calanoids	6.80	10.38	7.82	12.96	40.06
Cyclopoids	5.51	8.71	9.53	10.88	50.94
Dinoflagelate	4.94	7.41	7.31	9.26	60.20
Harpacticoids	4.71	7.28	7.36	9.10	69.30
Appendicularia	4.62	6.91	4.82	8.63	77.93
Tintinnid	4.59	6.77	8.33	8.46	86.39
Radiolarian	3.37	4.64	1.96	5.79	92.18

Tables S1.2. Similarity within SpringLB zooplankton stations (average similarity = 77.91 %)

Taxon	Ave. $\log_{10}$(Abun.+1)	Ave. Similarity	Sim/SD	% contribution to similarity	Cumulative % similarity
Calanoids	8.50	14.17	11.70	18.19	18.19
Nauplii	8.52	14.12	11.39	18.13	36.32
Cyclopoids	7.31	12.43	16.05	15.96	52.28
Poecilostomatoidea	6.51	10.16	10.98	13.04	65.32
Dinoflagelate	6.31	9.69	6.91	12.44	77.75
Appendicularia	4.56	6.19	2.41	7.95	85.70
Harpacticoids	3.35	3.67	0.92	4.72	90.42

Tables S1.3. Similarity within SpringHB zooplankton stations (average similarity = 80.09 %).

Taxon	Ave. $\log_{10}$(Abun.+1)	Ave. Similarity	Sim/SD	% contribution to similarity	Cumulative % similarity
Nauplii	8.45	13.70	9.10	17.11	17.11
Calanoids	8.21	13.63	17.68	17.01	34.12
Poecilostomatoidea	6.70	10.71	9.71	13.37	47.49
Cyclopoids	6.68	10.48	6.97	13.09	60.58
Dinoflagelate	6.26	9.65	6.64	12.05	72.63
Tintinnid	5.06	7.87	4.23	9.83	82.46
Harpacticoids	4.20	5.48	1.48	6.85	89.31
Euphausiid	2.49	3.18	2.47	3.97	93.28

Tables S1.4. Dissimilarity between Winter and SpringLB zooplankton stations (average similarity = 24.32 %).

	Winter	SpringHB				
Species	Ave. $\log_{10}$(Abun. +1)	Ave. $\log_{10}$(Abun.+1)	Ave. Dissimilarity	Diss./SD	% contribution to dissimilarity	Cumulative % similarity
Foraminifera	3.47	0.84	2.72	1.51	11.19	11.19
Radiolarian	3.37	1.52	2.08	1.44	8.57	19.76
Appendicularia	4.62	2.58	2.08	1.36	8.57	28.32
Polychaetes	1.63	1.27	1.72	1.05	7.09	35.41
Nauplii	7.05	8.45	1.69	1.44	6.95	42.37
Euphausiid	0.67	2.49	1.65	1.75	6.80	49.16
Calanoids	6.80	8.21	1.57	1.42	6.47	55.63
Dinoflagelate	4.94	6.26	1.53	1.46	6.28	61.92
Cyclopoids	5.51	6.68	1.35	1.50	5.56	67.47
Harpacticoids	4.71	4.20	1.34	1.11	5.52	72.99
Tintinnid	4.59	5.06	1.26	1.85	5.16	78.15
Tunicate	0.29	1.25	1.19	0.78	4.88	83.03
Thecosomes	0.93	0.54	0.93	0.85	3.81	86.84
Poecilostomatoidea	6.58	6.70	0.77	1.41	3.17	90.01

Tables S1.5. Dissimilarity between Winter and SpringLB zooplankton stations (average similarity = 28.66 %).

	Winter	SpringLB				
Species	Ave. log_{10}(Abun. +1)	Ave. log_{10}(Abun.+1)	Ave. Dissimilarity	Diss./SD	% contribution to dissimilarity	Cumulative % similarity
Foraminifera	3.47	0.00	3.05	1.66	10.65	10.65
Tintinnid	4.59	2.22	2.79	1.78	9.73	20.38
Radiolarian	3.37	1.37	2.74	2.12	9.57	29.95
Euphausiid	0.67	2.67	1.91	1.69	6.68	36.63
Calanoids	6.80	8.50	1.76	1.45	6.15	42.78
Harpacticoids	4.71	3.35	1.69	1.06	5.89	48.67
Cyclopoids	5.51	7.31	1.67	1.86	5.82	54.49
Nauplii	7.05	8.52	1.67	1.39	5.82	60.30
Polychaetes	1.63	1.17	1.64	1.02	5.73	66.03
Dinoflagelate	4.94	6.31	1.58	1.38	5.51	71.54
Appendicularia	4.62	4.56	1.34	1.24	4.68	76.22
Tunicate	0.29	1.41	1.30	1.16	4.53	80.75
Siphonophore	0.41	1.39	0.98	0.99	3.43	84.18
Hydromedusae	0.37	0.99	0.94	0.77	3.29	87.47
Ostracods	0.20	0.94	0.88	0.69	3.07	90.55

101 Tables S1.6. Dissimilarity between SpringHB and SpringLB zooplankton stations (average similarity = 21.56 %).
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	SpringHB	SpringLB				
Species	Ave. log_{10}(Abun. +1)	Ave. log_{10}(Abun.+1)	Ave. Dissimilarity	Diss./SD	% contribution to dissimilarity	Cumulative % similarity
Tintinnid	5.06	2.22	2.99	1.71	13.87	13.87
Appendicularia	2.58	4.56	2.21	1.45	10.24	24.12
Harpacticoids	4.20	3.35	1.88	1.07	8.73	32.85
Radiolarian	1.52	1.37	1.80	1.00	8.33	41.18
Tunicate	1.25	1.41	1.45	1.24	6.71	47.89
Polychaetes	1.27	1.17	1.35	1.18	6.24	54.13
Euphausiid	2.49	2.67	1.32	1.47	6.10	60.23
Dinoflagelate	6.26	6.31	1.11	1.42	5.17	65.40
Ostracods	0.73	0.94	1.09	0.84	5.04	70.44
Poecilostomatoidea	6.70	6.51	0.98	1.45	4.53	74.98
Siphonophore	0.73	1.39	0.92	1.06	4.26	79.24
Hydromedusae	0.09	0.99	0.82	0.68	3.80	83.04
Nauplii	8.45	8.52	0.81	1.43	3.76	86.80
Cyclopoids	6.68	7.31	0.76	1.01	3.54	90.34

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S1. (Below) Biplots of POM source and consumer $\delta^{15}N$ and $\delta^{13}C$ used in Mixing Model Analysis. POM values are adjusted using mean Trophic Discrimination Factors from a global meta-analysis of 2.75 (± 0.1) for $\delta^{15}N$ and 0.75 (± 0.11) for $\delta^{13}C$ [*Caut et al.*, 2009]. Zooplankton group numbers refer to: 1 – 64µm; 2 - 125 µm; 3 - 250 µm ; 4 - 500 µm; 5 - 1000 µm; 6 - 2000 µm; 7 – 4000 µm; 8 - Euphausiid.

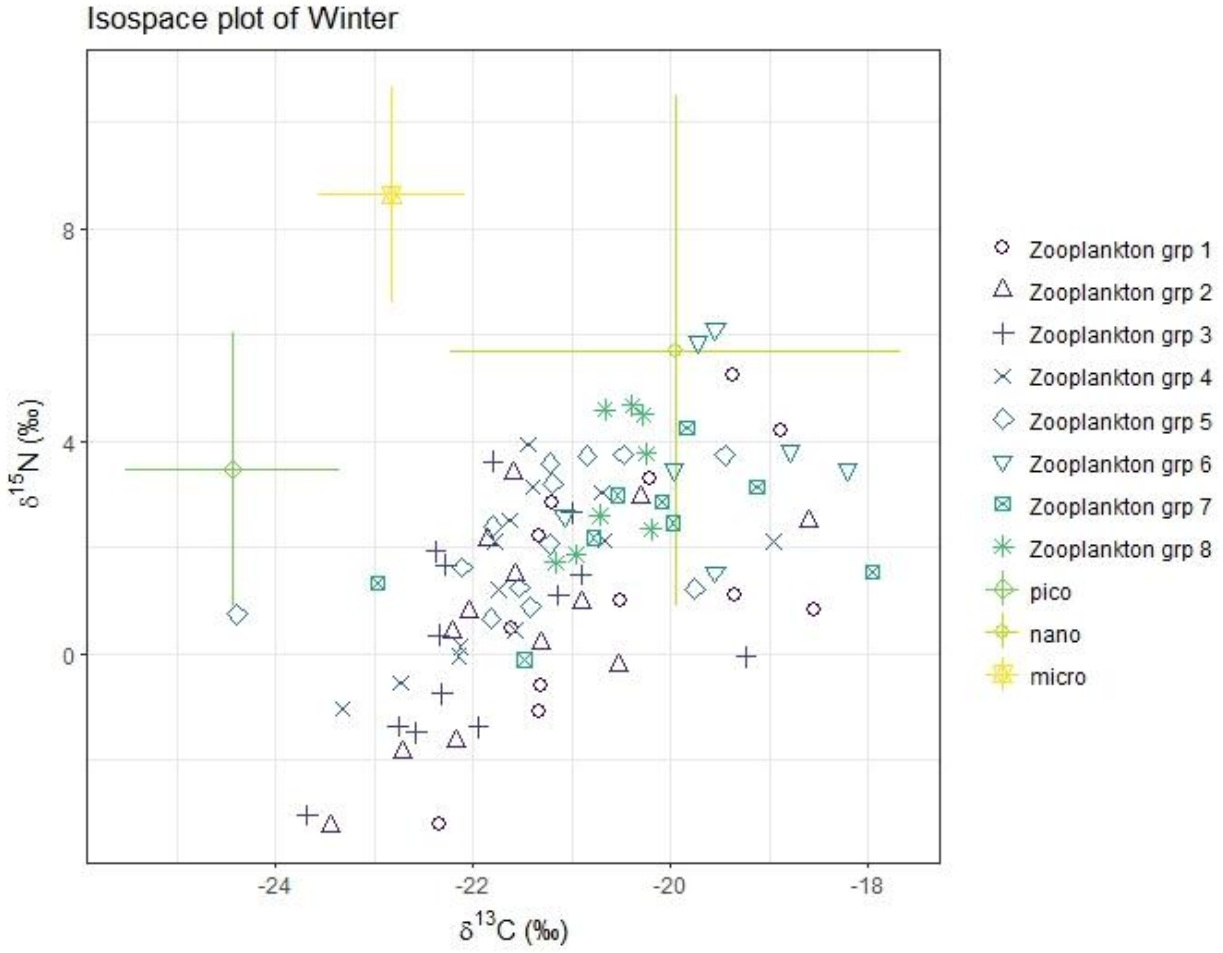


Figure S1.1. Biplot of POM sources and consumers for the Winter DEWEX survey. [*Caut et al.*, 2009]

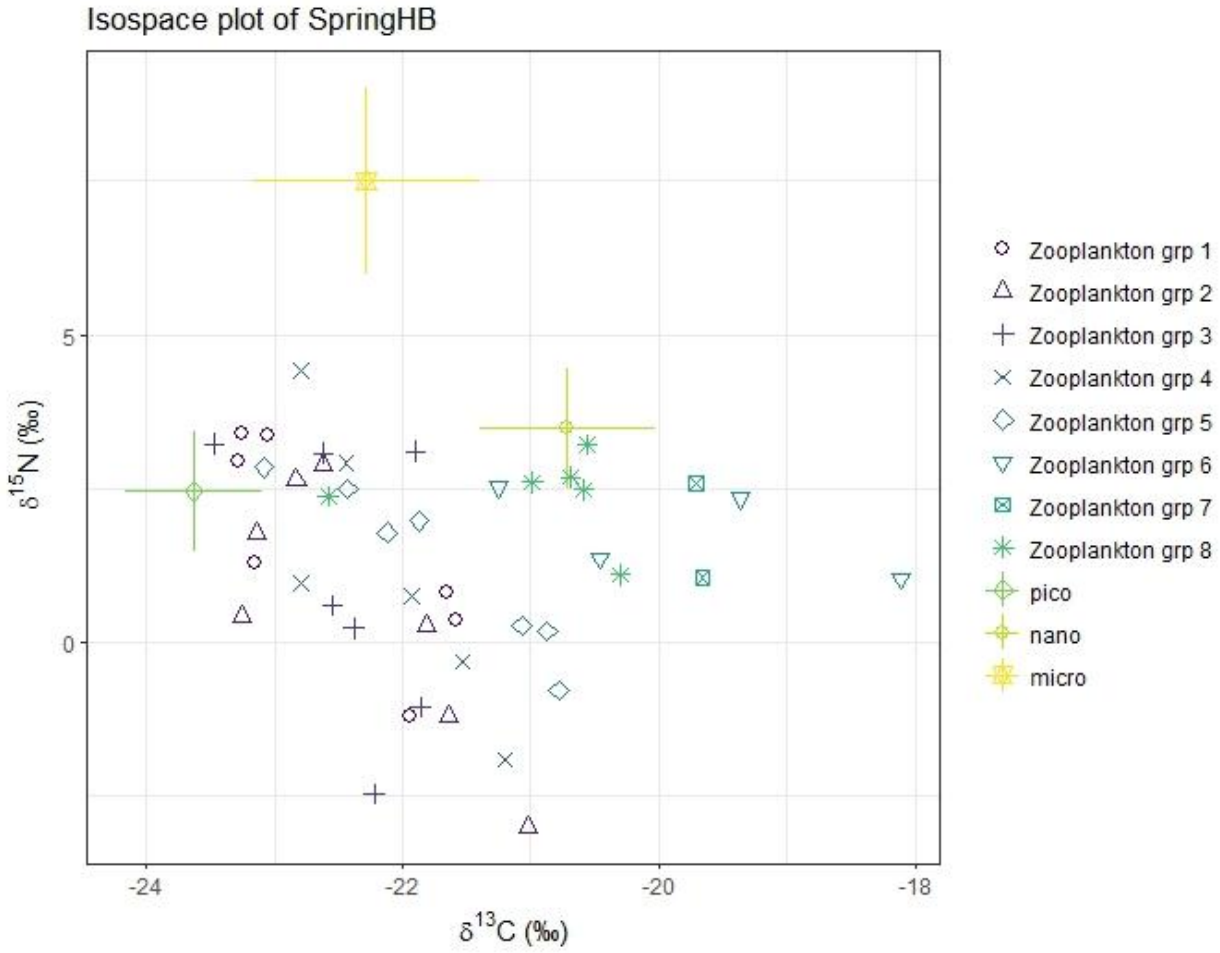


Figure S1.2. Biplot of POM sources and consumers for SpringHB[*Caut et al.*, 2009].

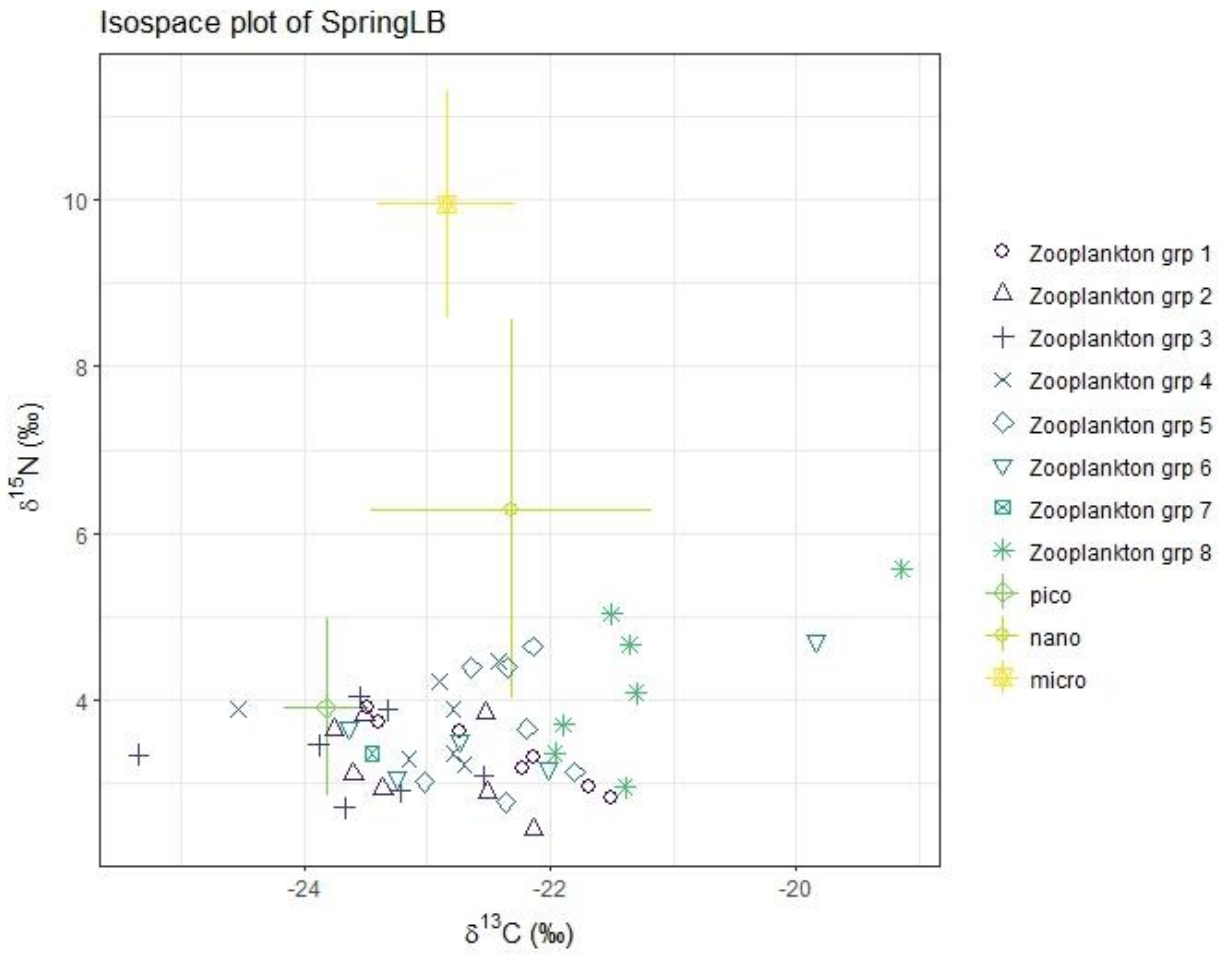
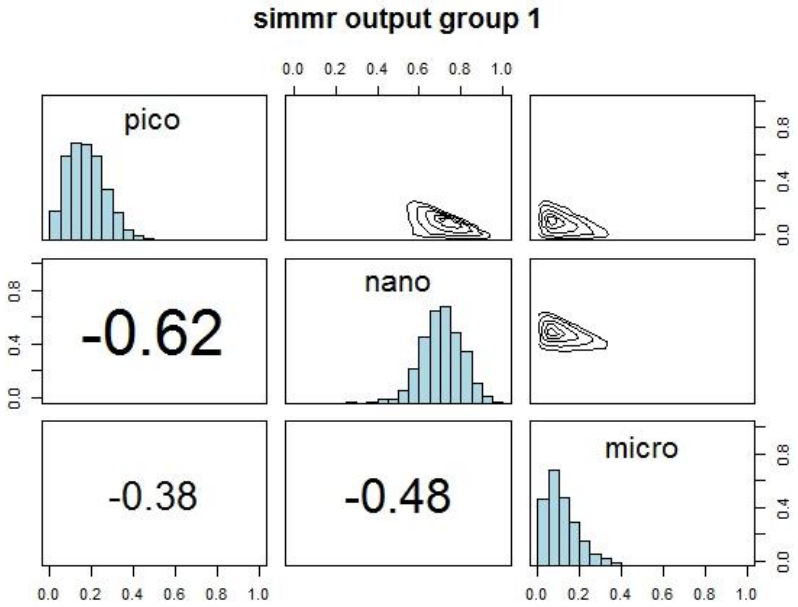
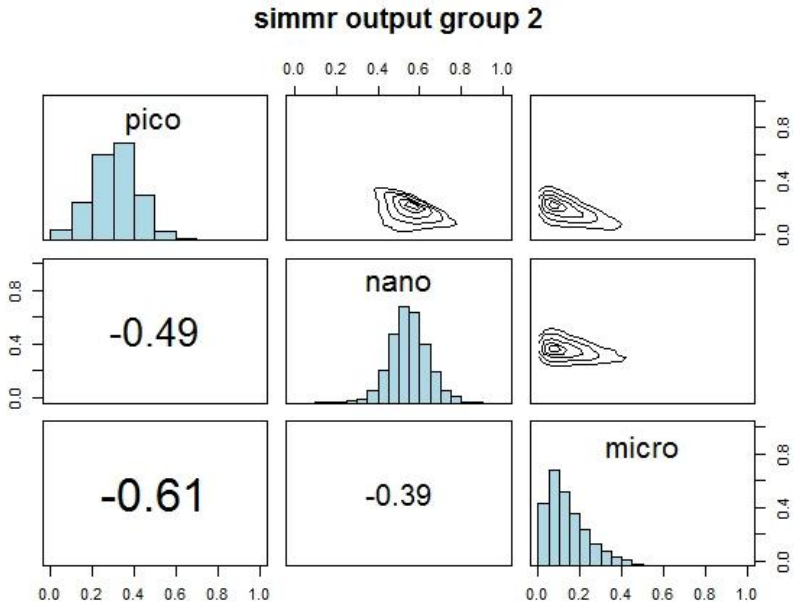


Figure S1.3. Biplot of POM sources and consumers for SpringLB[*Caut et al.*, 2009].

Figure S.2.1. (Below) Matrix plot of potential POM food sources for zooplankton groups 1 to 8 during Winter. The diagonal cells show the posterior probability distributions for each of the three POM size fractions. The cells below the diagonal show the correlations between contributions for pairs of potential food sources. The cells above the diagonal show contours of the joint posterior probability distribution for contributions for pairs of potential food sources. Zooplankton group numbers refer to: 1 – 64μm; 2 - 125 μm; 3 - 250 μm ; 4 - 500 μm; 5 - 1000 μm; 6 - 2000 μm; 7 – 4000 μm; 8 - Euphausiid.

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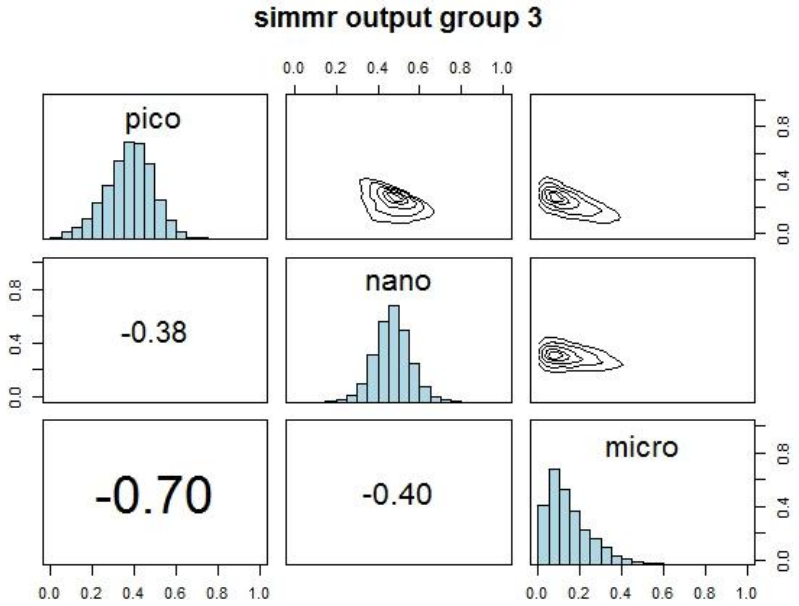
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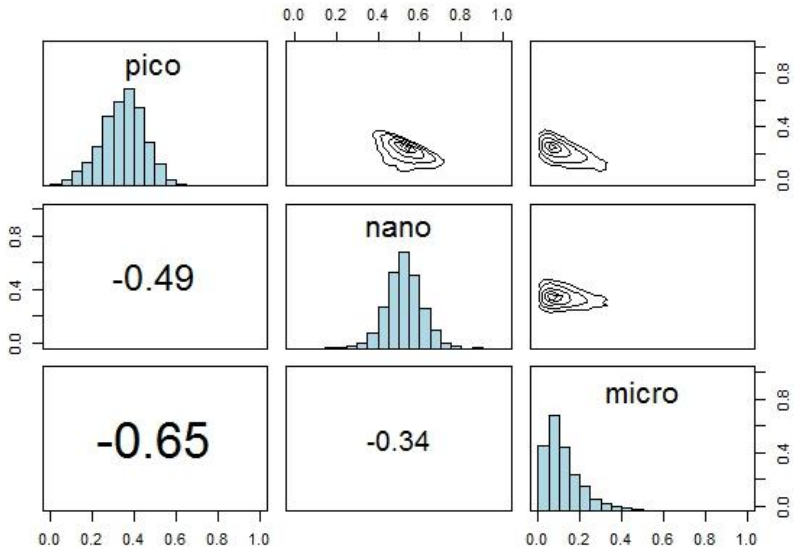
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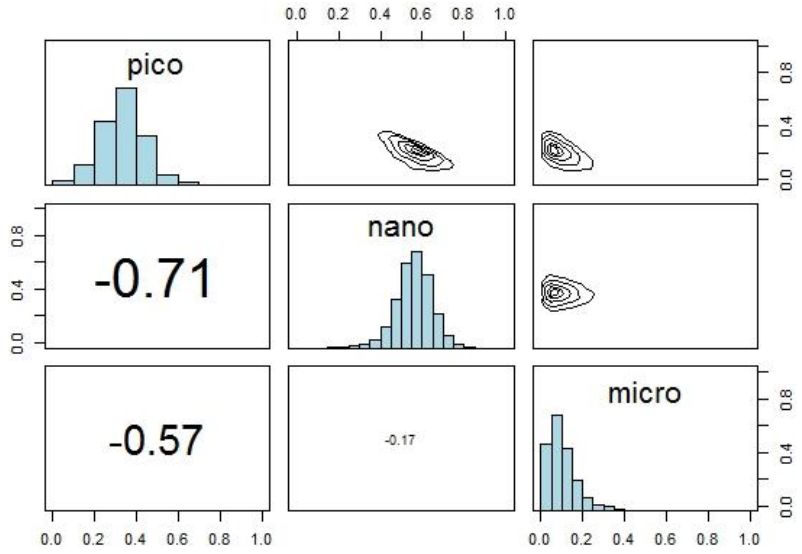
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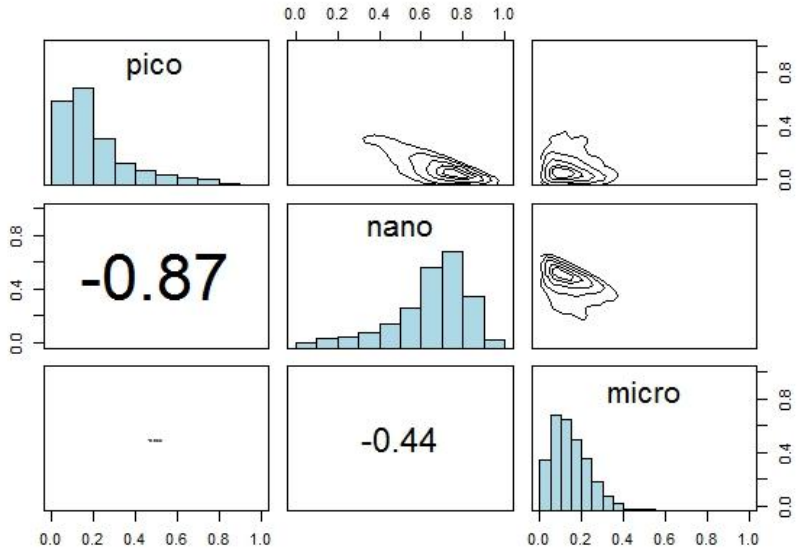
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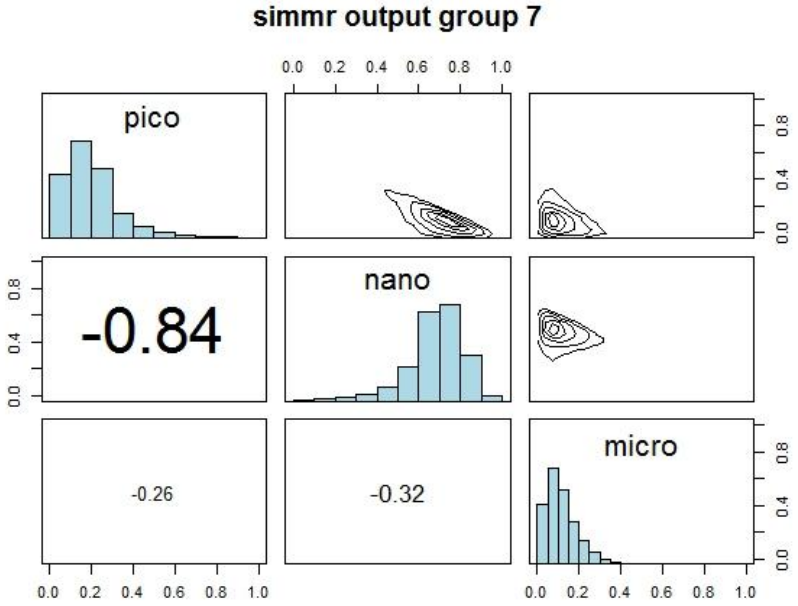
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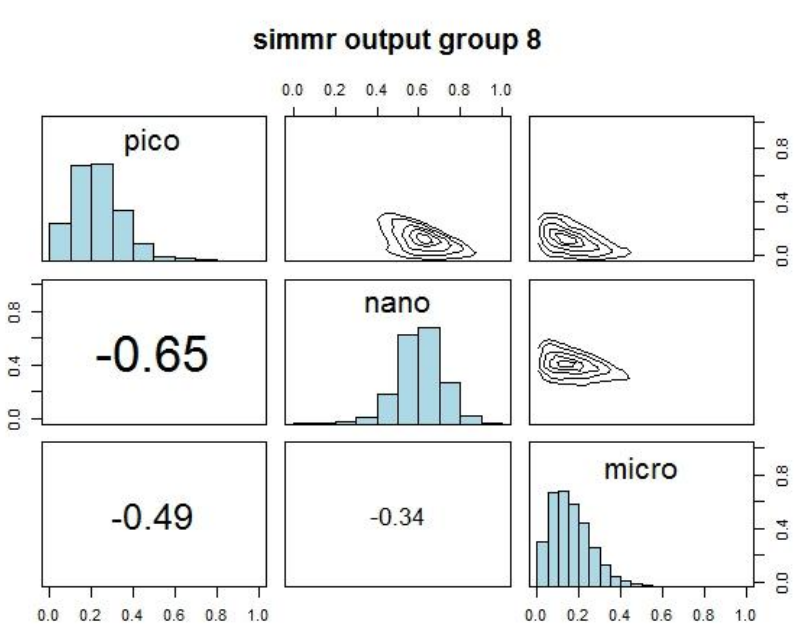
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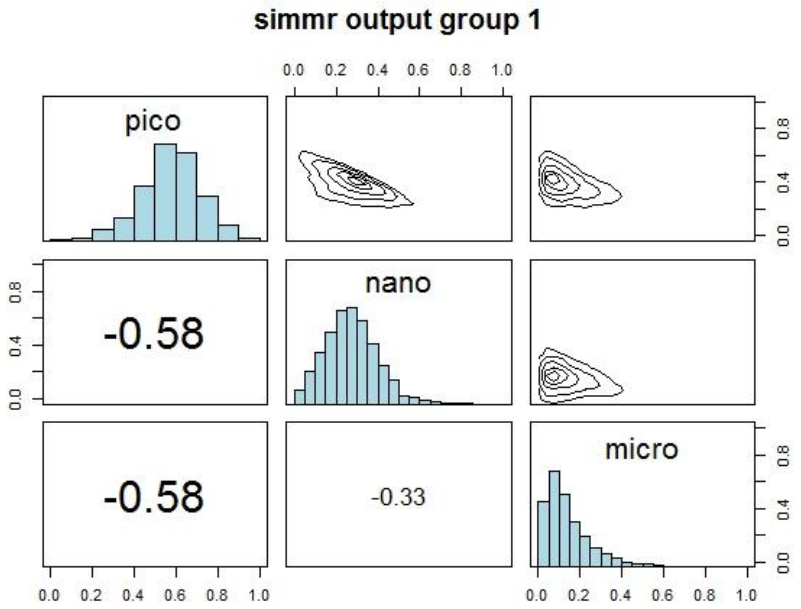
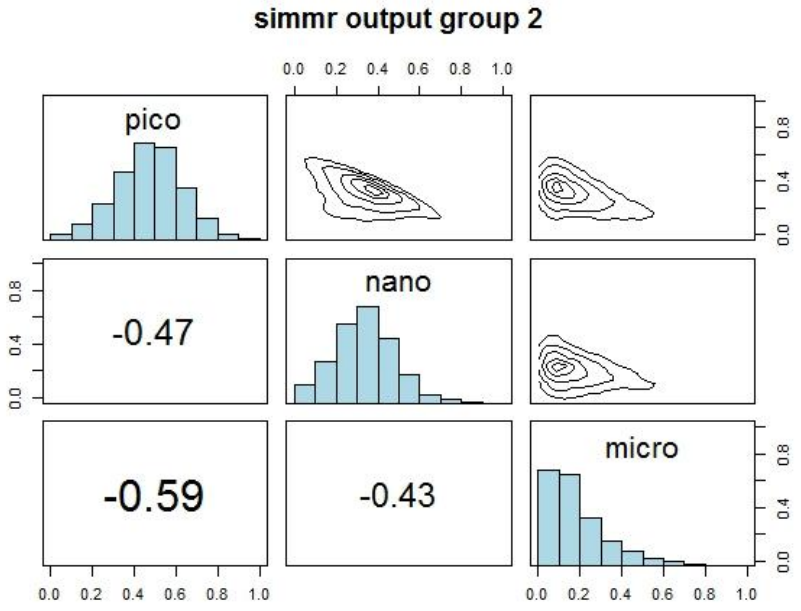
Figure S.2.2. (Below) Matrix plot of potential POM food sources for zooplankton groups 1 to 8 during Spring HB. The diagonal cells show the posterior probability distributions for each of the three POM size fractions. The cells below the diagonal show the correlations between contributions for pairs of potential food sources. The cells above the diagonal show contours of the joint posterior probability distribution for contributions for pairs of potential food sources. Zooplankton group numbers refer to: 1 – 64μm; 2 - 125 μm; 3 - 250 μm ; 4 - 500 μm; 5 - 1000 μm; 6 - 2000 μm; 7 – 4000 μm; 8 - Euphausiid.

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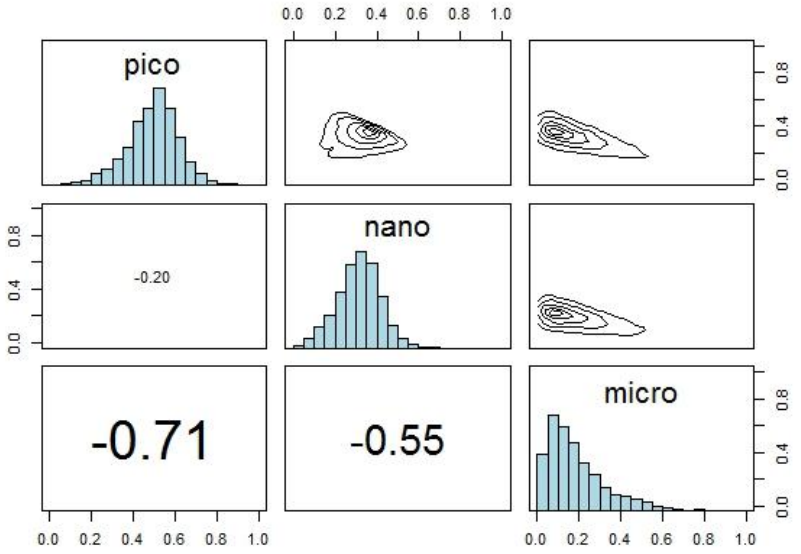
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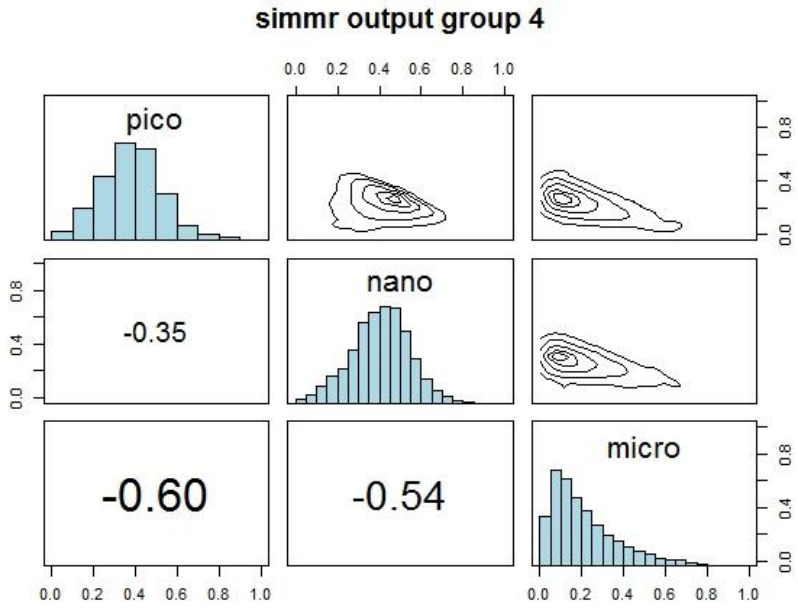
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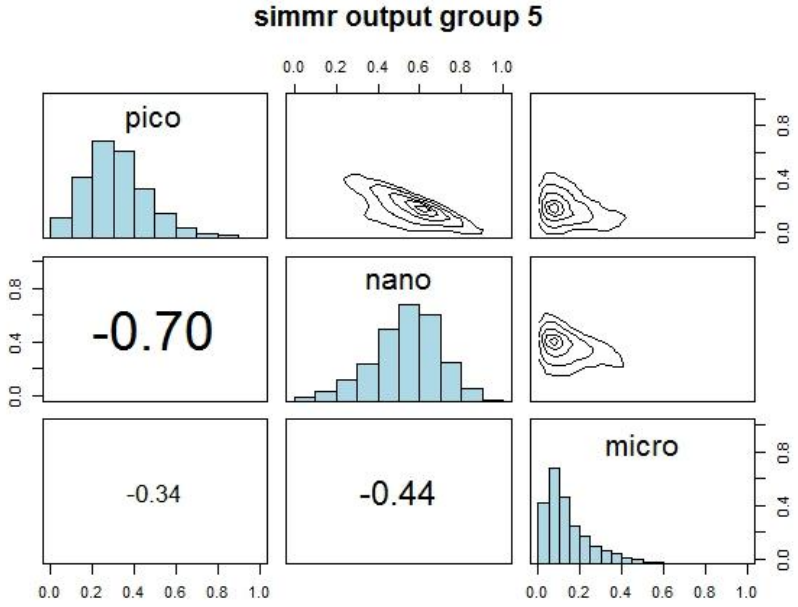
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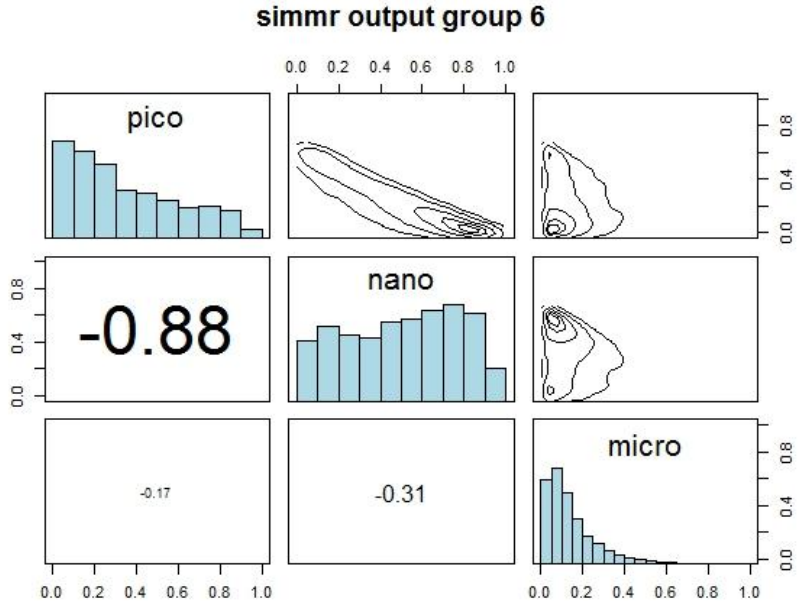
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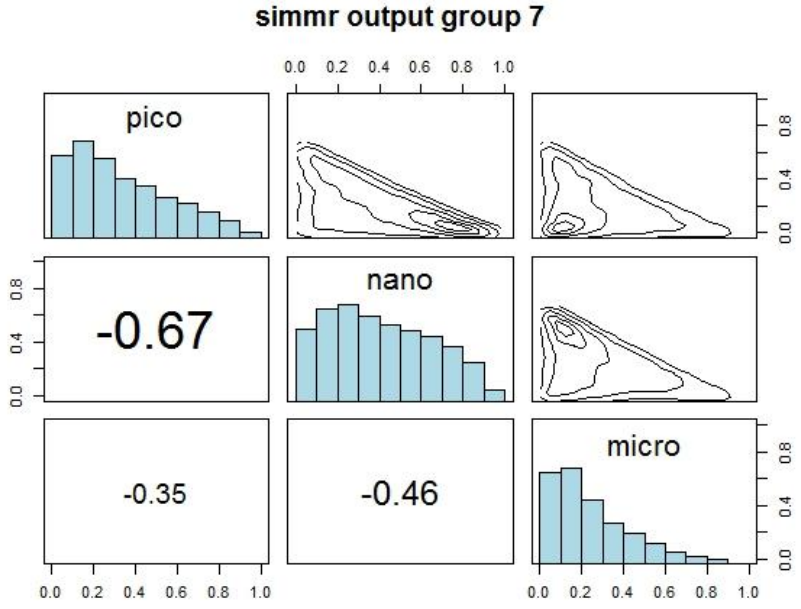
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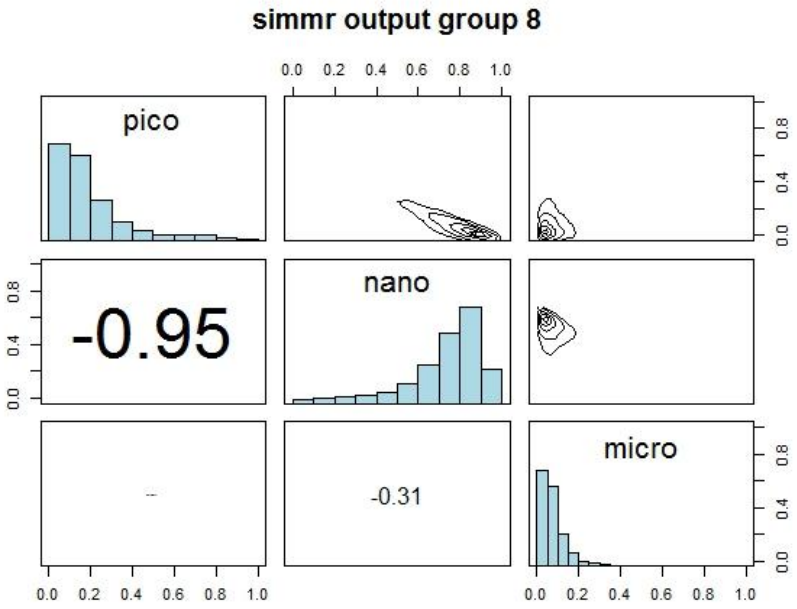
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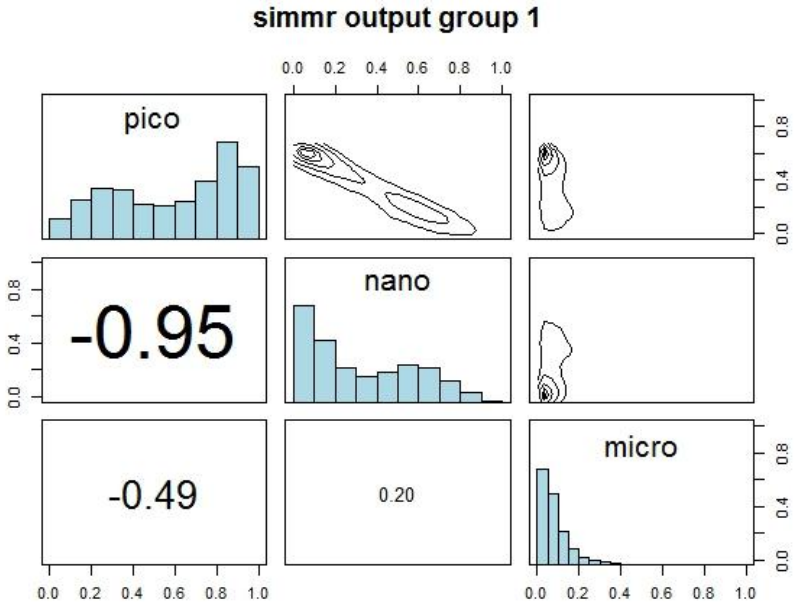
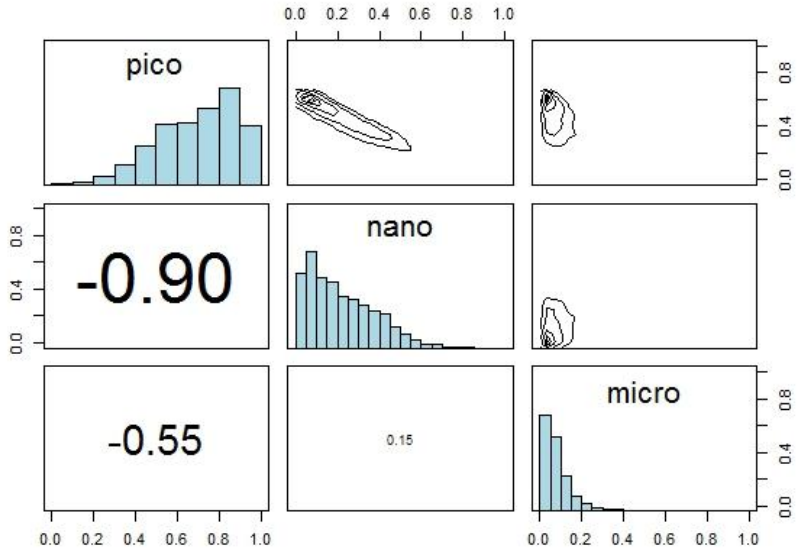
Figure S.2.3 Matrix plot of potential POM food sources for zooplankton during SpringLB. The diagonal cells show the posterior probability distributions for each of the three POM size fractions. The cells below the diagonal show the correlations between contributions for pairs of potential food sources. The cells above the diagonal show contours of the joint posterior probability distribution for contributions for pairs of potential food sources. Zooplankton group numbers refer to: 1 – 64μm; 2 - 125 μm; 3 - 250 μm ; 4 - 500 μm; 5 - 1000 μm; 6 - 2000 μm; 7 – 4000 μm; 8 - Euphausiid.

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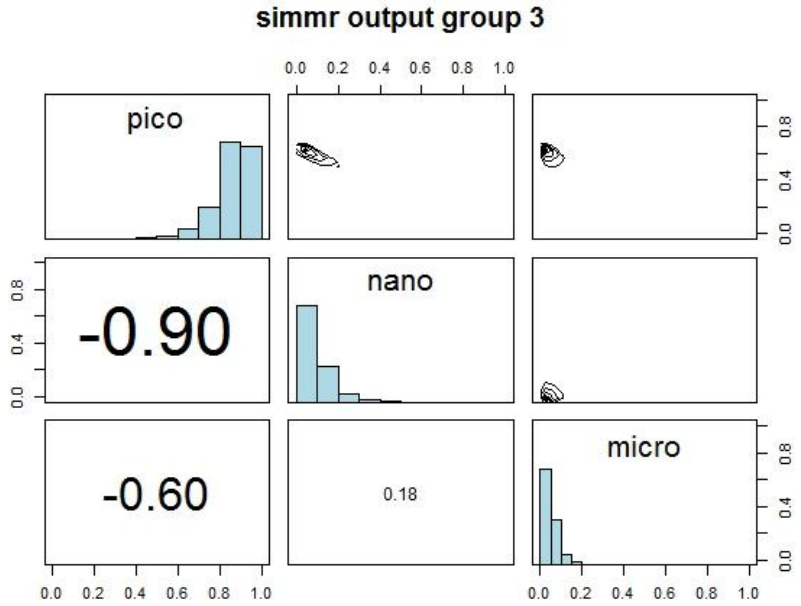
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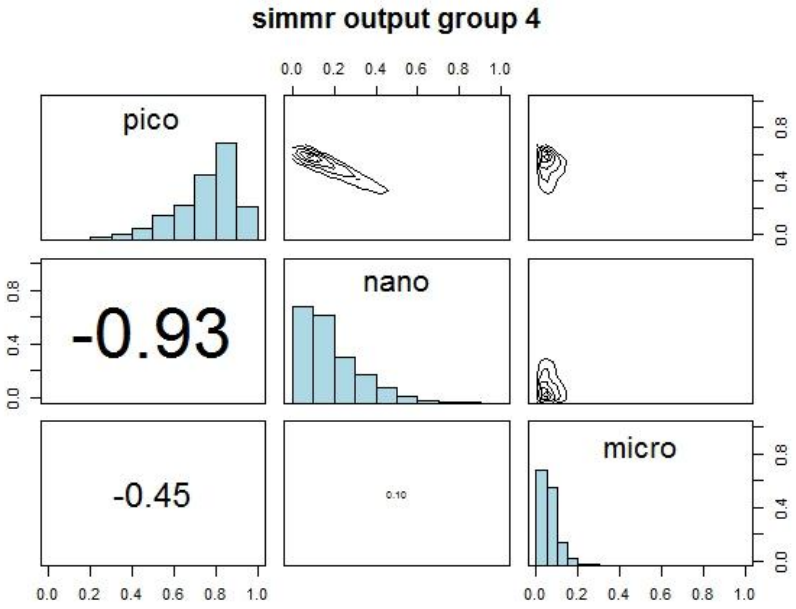
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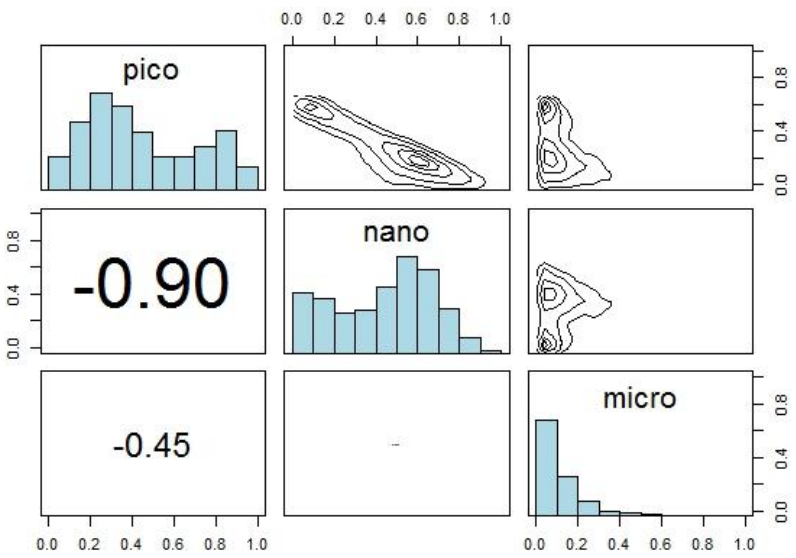
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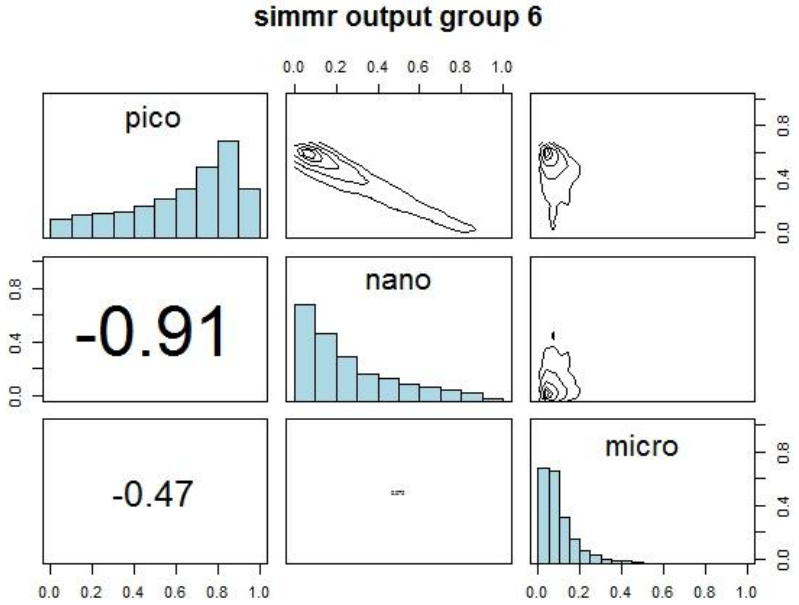
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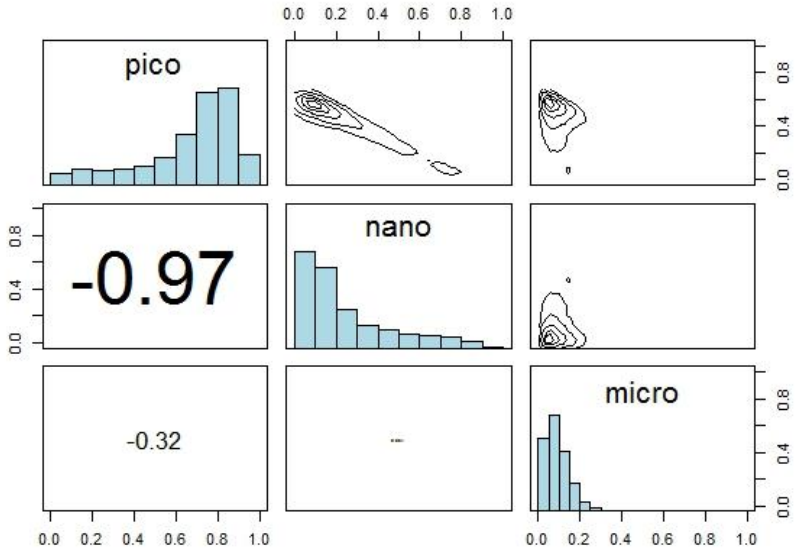
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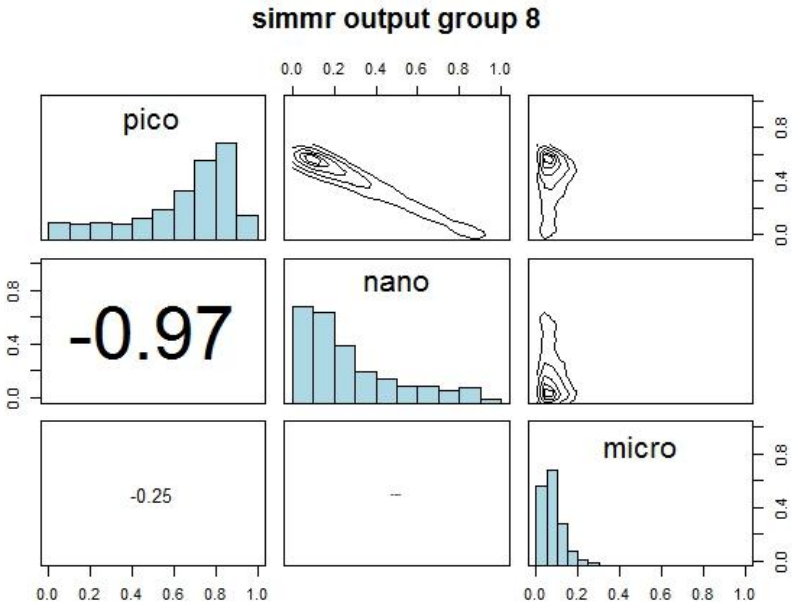
simmr output group 8
pico
nano
micro
-0.97
-0.25
0.0 0.2 0.4 0.6 0.8 1.0