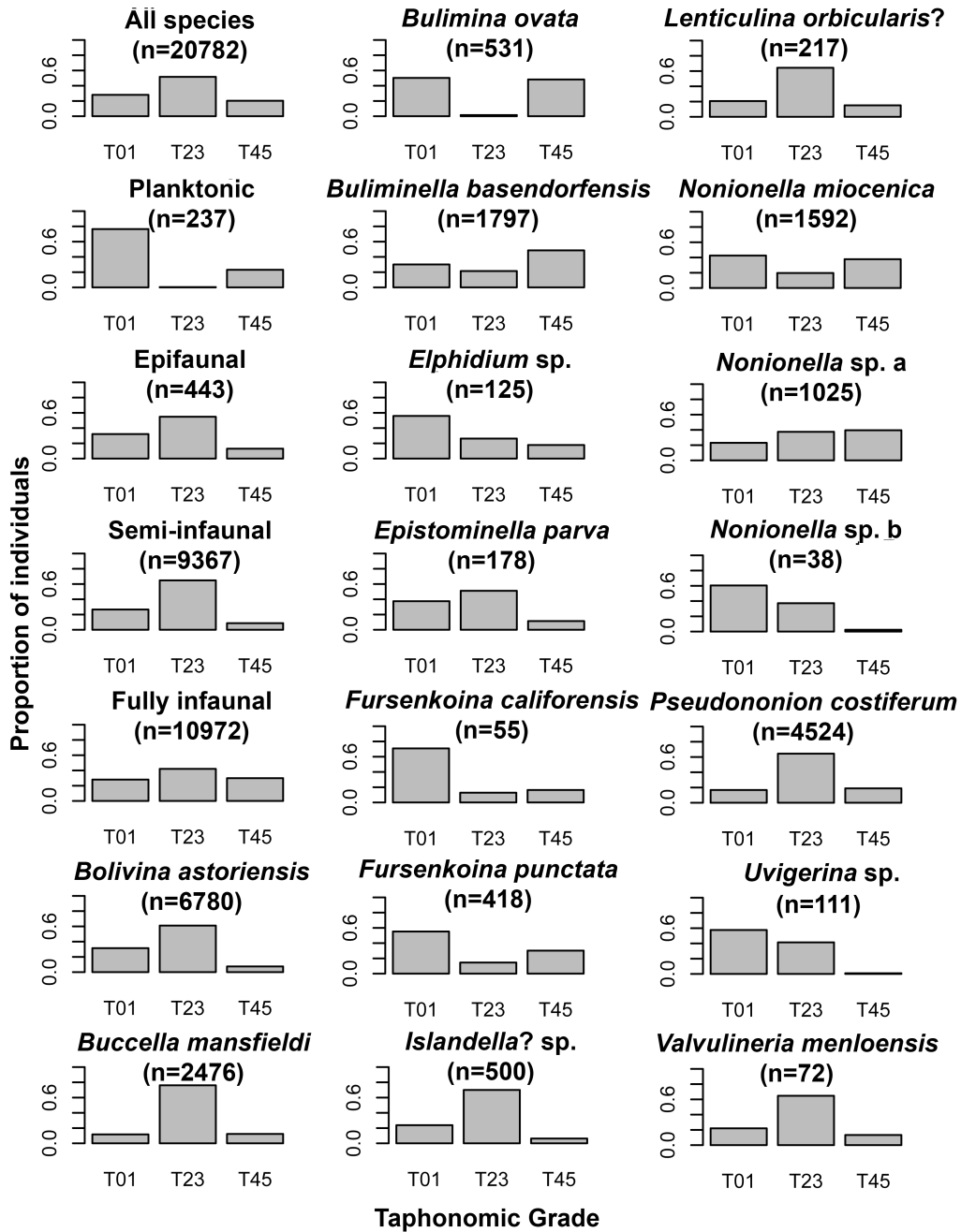# SUPPLEMENTAL ONLINE MATERIALS

TABLE A.1. Frequency of taphonomic scores in each foraminiferal sample recorded by species. The first column indicates which samples were disaggregated using a shaker table; agitation does not appear to have broken additional individuals.
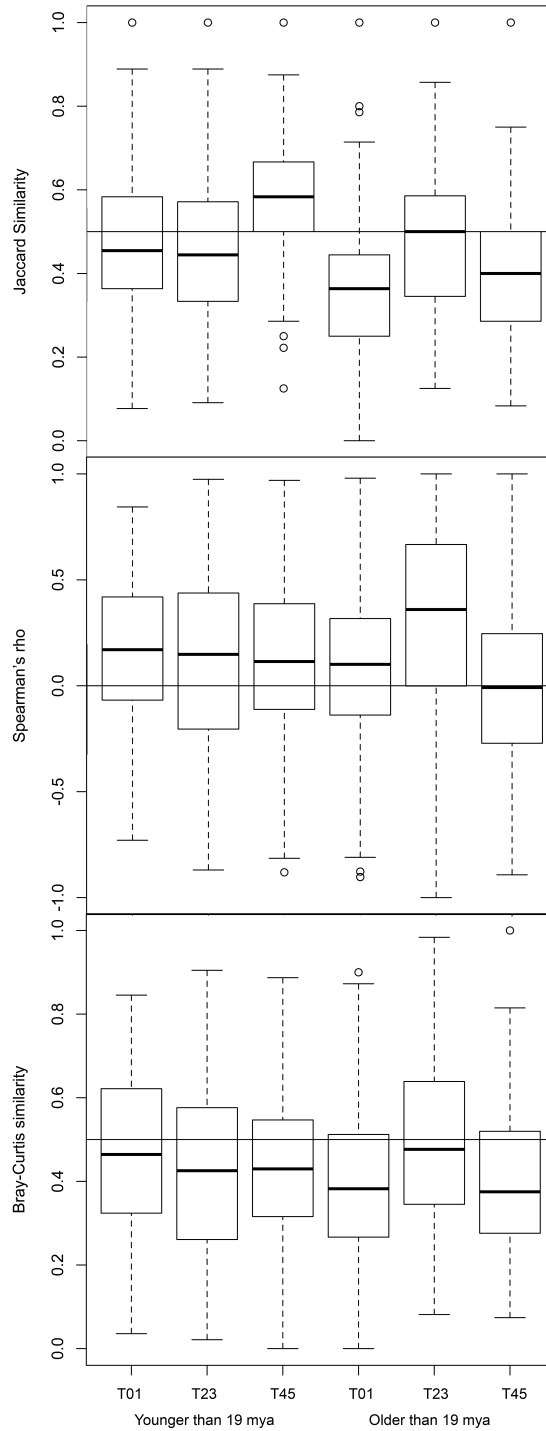
See Supplementary File: TableA1.xls

TABLE A.2. Number of species and community evenness (PIE) calculated for each taphonomic grade and nested taphonomic grade.

See Supplementary File: TableA2.xls

FIGURE A.1. Histograms of the frequency of taphonomic grades for common benthic foraminiferal taxa, and ecological groups of benthic foraminifera, from the Newport Member.

FIGURE A.2. Boxplots of median Jaccard (presence-absence) similarities, Spearman rho rank-abundance correlations, and Bray-Curtis (proportional abundance) similarities for between sample comparisons within taphonomic grades T01, T23, and T45. Left three plots are between sample comparisons for samples younger than 19 mya. Right three plots are of samples older than 19 mya. This figure continues from Figure 3.

TABLE A.3. Kruskal-Wallis tests and post-hoc Mann-Whitney tests for differences in medians between similarity metrics (Jaccard, Spearman's rho, and Bray-Curtis) for comparisons between taphonomic grades. Taphonomic subsamples from the same sample are more similar to each other on average than are subsamples of the same taphonomic grade from different samples. Tests that are not significantly different after Bonferroni correction (p<0.001) are marked (ns).

	Jaccard	Spearman's rho	Bray-Curtis
Kruskal-Wallis test	H=263	H=476	H=306
	p<0.001	p<0.001	p<0.001
Mann-Whitney tests			
T01vsT23 (n=46)	U=801.5	U=881.5	U=872
T23vsT45 (n=43)	p=0.124 (ns)	p=0.3796 (ns)	p=0.3386 (ns)
T01vsT23 (n=46)	U=711.5	U=821	U=657.5
T01vsT45 (n=37)	p=0.2019 (ns)	p=0.7869 (ns)	p=0.0793 (ns)
T23vsT45 (n=43)	U=755	U=698.5	U=714
T01vsT45 (n=37)	p=0.699 (ns)	p=0.3517 (ns)	p=0.4332 (ns)
T01vsT23 (n=46)	U=14070	U=10420	U=11280
AllT01 (n=1081)	p<0.0001	p<0.0001	p<0.0001
T23vsT45 (n=43)	U=9874	U=12790	U=12450
AllT01 (n=1081)	p<0.0001	p<0.0001	p<0.0001
T01vst45 (n=37)	U=7738	U=8922	U=11050
AllT01 (n=1081)	p<0.0001	p<0.0001	p<0.0001
T01vsT23 (n=46)	U=20980	U=19810	U=16630
AllT23 (n=1378)	p<0.0001	p<0.0001	p<0.0001
T23vsT45 (n=43)	U=15030	U=21980	U=18280
AllT23 (n=1378)	p<0.0001	p=0.004 (ns)	p<0.0001
T01vst45 (n=37)	U=12330	U=16140	U=16600
AllT23 (n=1378)	p<0.0001	p<0.0001	p=0.0003
T01vsT23 (n=46)	U=14490	U=7736	U=8565
AllT45 (n=946)	p<0.0001	p<0.0001	p<0.0001
T23vsT45 (n=43)	U=10430	U=9188	U=9491
AllT45 (n=946)	p<0.0001	p<0.0001	p<0.0001
T01vst45 (n=37)	U=8611	U=6425	U=8252
AllT45 (n=946)	p<0.0001	p<0.0001	p<0.0001
T01vsT23 (n=46)	U=23880	U=21140	U=20510
AllT01vsAll23 (n=2116)	p<0.0001	p<0.0001	p<0.0001
T23vsT45 (n=43)	U=16640	U=25530	U=22580
AllT01vsAll23 (n=2116)	p<0.0001	p<0.0001	p<0.0001
T01vsT45 (n=37)	U=12590	U=17900	U=19780
AllT01vsAllT23 (n=2116)	p<0.0001	p<0.001	p<0.0001
T01vsT23 (n=46)	U=26480	U=13590	U=14300
AllT23vsAll45 (n=1849)	p<0.0001	p<0.0001	p<0.0001
T23vsT45 (n=43)	U=18910	U=16820	U=16160
AllT23vsAll45 (n=1849)	p<0.0001	p<0.0001	p<0.0001
T01vsT45 (n=37)	U=15470	U=11400	U=13650
AllT23vsAll45 (n=1849)	p<0.0001	p<0.0001	p<0.0001
T01vsT23 (n=46)	U=20800	U=11850	U=10460
AllT01vsAllT45 (n=1369)	p<0.0001	p<0.0001	p<0.0001
T23vsT45 (n=1369)	U=14910	U=14550	U=11730
AllT01vsAllT45 (n=43)	p<0.0001	p<0.0001	p<0.0001
T01vsT45 (n=1369)	U=12100	U=10040	U=9783
AllT01AllT45 (n=37)	p<0.0001	p<0.0001	p<0.0001

TABLE A.4. Friedman's tests and post-hoc Wilcoxon tests for difference in medians between related paired observations for number of species, PIE, % infaunal taxa, and % shallow infaunal taxa between nested taphonomic grades in Figure 7. Null hypothesis is that the median difference between pairs of observations is zero. For Friedman's test (first row), number of samples is 37, number of treatments (k) is 5, and degrees of freedom (df) is 5. **p<0.01, ***p<0.001. For Wilcoxon tests, number of samples is 47 for each nested grade except T45, which only has 37 samples. Following a Bonferroni correction for each set of 10 Wilcoxon tests, significance level is 0.005 for an uncorrected α of 0.05. * indicates a significant difference given this correction.

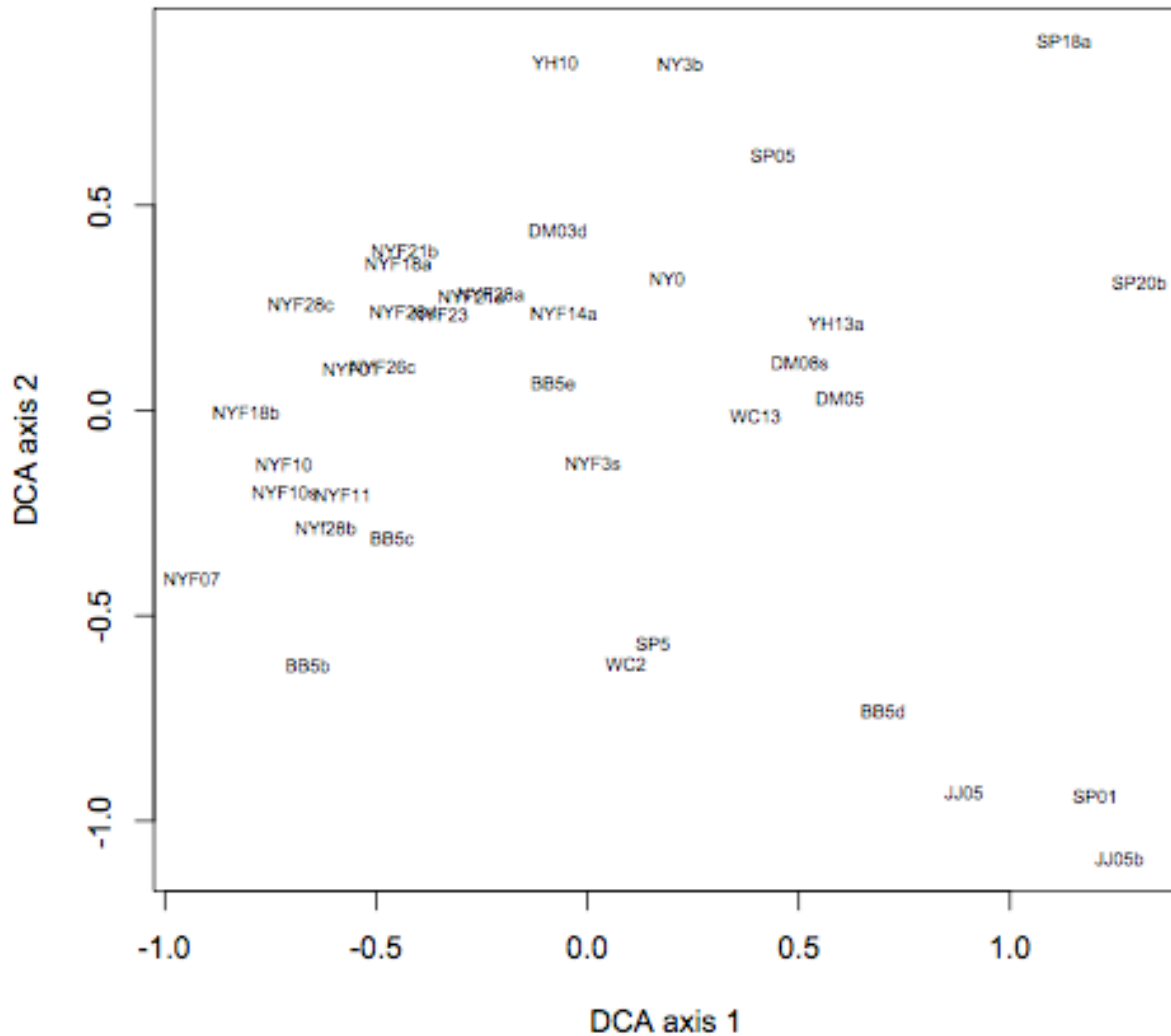|	# of species	PIE	% infaunal	% semi-infaunal
Friedman's Test	$X^2 = 39.135$	$X^2 = 13.211$	$X^2 = 60.476$	$X^2 = 53.016$
	p<0.001	p=0.01	p=<0.001	p<0.001
Wilcoxon Tests				
T01 vs	W=813.5	W=453.5	W=669.5	W=779.5
T01-23	p=0.008	p=0.230	p=0.086	p=0.022
T01 vs	W=780	W=534	W=745	W=625.5
T01-23-45	p=0.008	p=0.856	p=0.055	p=0.520
T01 vs	W=946	W=624	W=764.5	W=645
T23-45	p<0.001*	p=0.234	p=0.033	p=0.399
T01 vs	W=590	W=350.5	W=610	W=657
T45	p<0.001*	p=0.213	p<0.001*	p<0.001*
T01-23 vs	W=625	W=557.5	W=1088	W=1054
T01-23-45	p=0.519	p=0.046	p<0.001*	p<0.001*
T01-23 vs	W=941	W=576	W=976	W=877
T23-45	p<0.001*	p=0.700	p<0.001*	p<0.001*
T01-23 vs	W=523	W=371.5	W=687	W=679
T45	p=0.009	p=0.767	p<0.001*	p<0.001*
T01-23-45	W=1079	W=645	W=785.5	W=683.5
vs T23-45	p<0.001*	p=0.005*	P=0.018	p=0.209
T01-23-45	W=570.5	W=415.5	W=689	W=685
vs T45	p<0.001*	p=0.195	p<0.001*	p<0.001*
T23-45 vs	W=463.5	W=306.5	W=680	W=685
T45	p=0.093	p=0.650	p<0.001*	p<0.001*

TABLE A.5. Spearman rho correlations between ecological metrics in time series pairs with different taphonomic grades. Following a Bonferroni correction for each set of 10 comparisons, significance level is 0.005 for an uncorrected α of 0.05. * indicates a significant correlation given this correction.

	Species richness	PIE (evenness)	% infaunal	% semi-infaunal	% Buliminacea
T01 vs T01-23	0.832	0.653	0.760	0.782	0.872
	p<0.001*	p<0.001*	p<0.001*	p<0.001*	p<0.001*
T01 vs T01-23-45	0.876	0.666	0.696	0.745	0.832
	p<0.001*	p<0.001*	p<0.001*	p<0.001*	p<0.001*
T01 vs T23-45	0.674	0.367	0.509	0.574	0.642
	p<0.001*	p=0.011	p<0.001*	p<0.001*	p<0.001*
T01 vs T45	0.520	0.15	0.388	0.536	0.703
	p<0.001*	p=0.375	p=0.017	p<0.001*	p<0.001*
T01-23 vs T01-23-45	0.935	0.919	0.926	0.958	0.913
	p<0.001*	p<0.001*	p<0.001*	p<0.001*	p<0.001*
T01-23 vs T23-45	0.823	0.687	0.859	0.894	0.779
	p<0.001*	p<0.001*	p<0.001*	p<0.001*	p<0.001*
T01-23 vs T45	0.380	0.118	0.483	0.647	0.673
	p-0.020	p=0.486	p=0.002*	p<0.001*	p<0.001*
T01-23-45 vs T23-45	0.879	0.852	0.954	0.953	0.981
	p<0.001*	p<0.001*	p<0.001*	p<0.001*	p<0.001*
T01-23-45 vs T45	0.617	0.347	0.655	0.777	0.915
	p<0.001*	p=0.035	p<0.001*	p<0.001*	p<0.001*
T23-45 vs T45	0.627	0.525	0.754	0.822	0.926
	p<0.001*	p<0.001*	p<0.001*	p<0.001*	p<0.001*

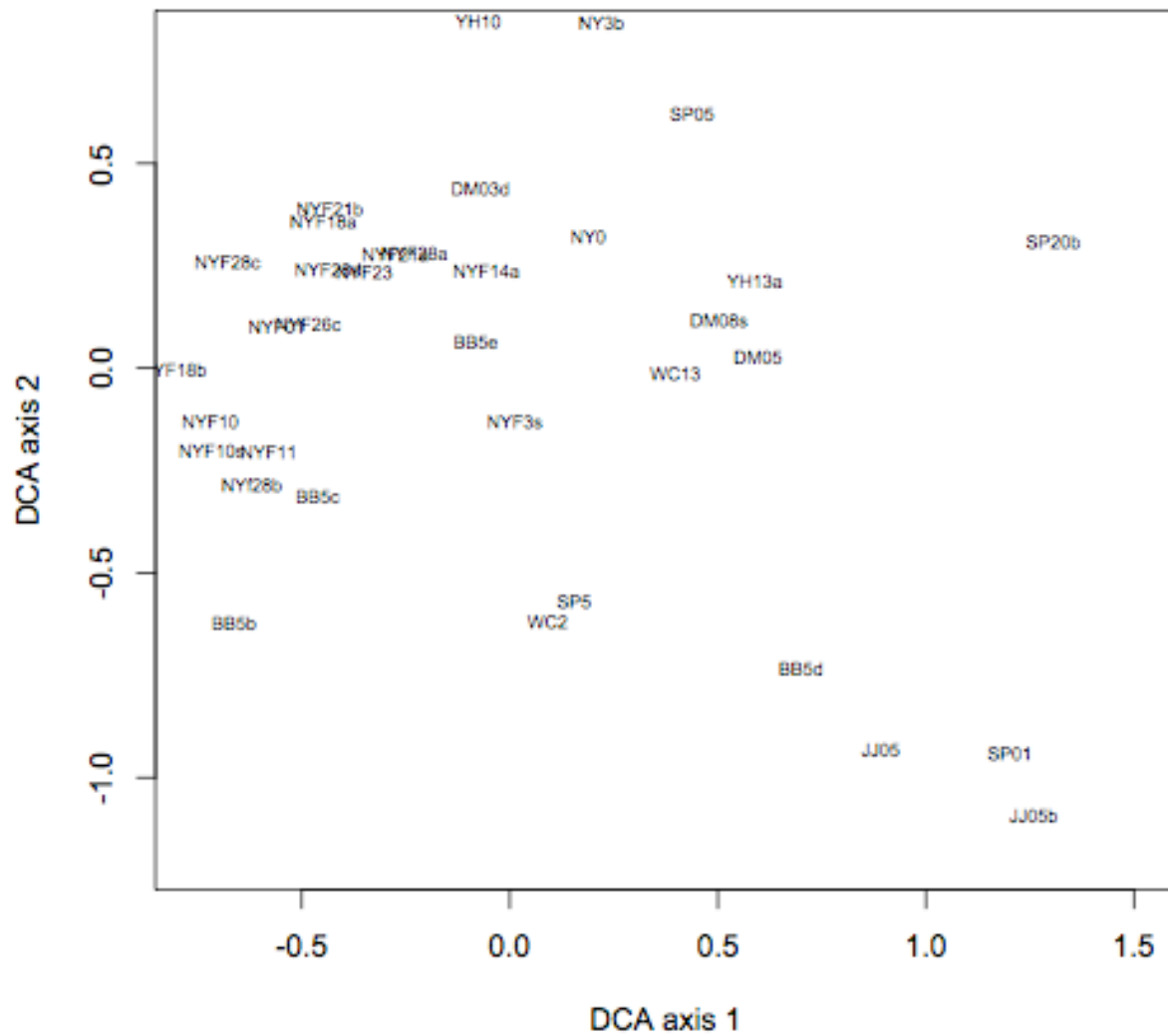**TABLE A.6.** Eigenvalues for the first 4 axes of detrended correspondence analyses.

	DCA1	DCA2	DCA3	DCA4
T01	0.3637	0.2449	0.1806	0.1613
T01-23	0.3656	0.2288	0.1715	0.1421
T01-23-45	0.3356	0.2408	0.1972	0.1503
T23-45	0.3918	0.2363	0.2454	0.1447
T-45	0.3878	0.2950	0.2097	0.1718
T-23	0.4401	0.2745	0.1964	0.1580

FIGURE A.3. Detrended correspondence analysis plot for benthic foraminifera of taphonomic grades T01. Text gives the sample name. Compare to Figures A.4-A.8 to see the general agreement among detrended correspondence analyses for benthic foraminifera of other taphonomic grades and nested taphonomic grades.
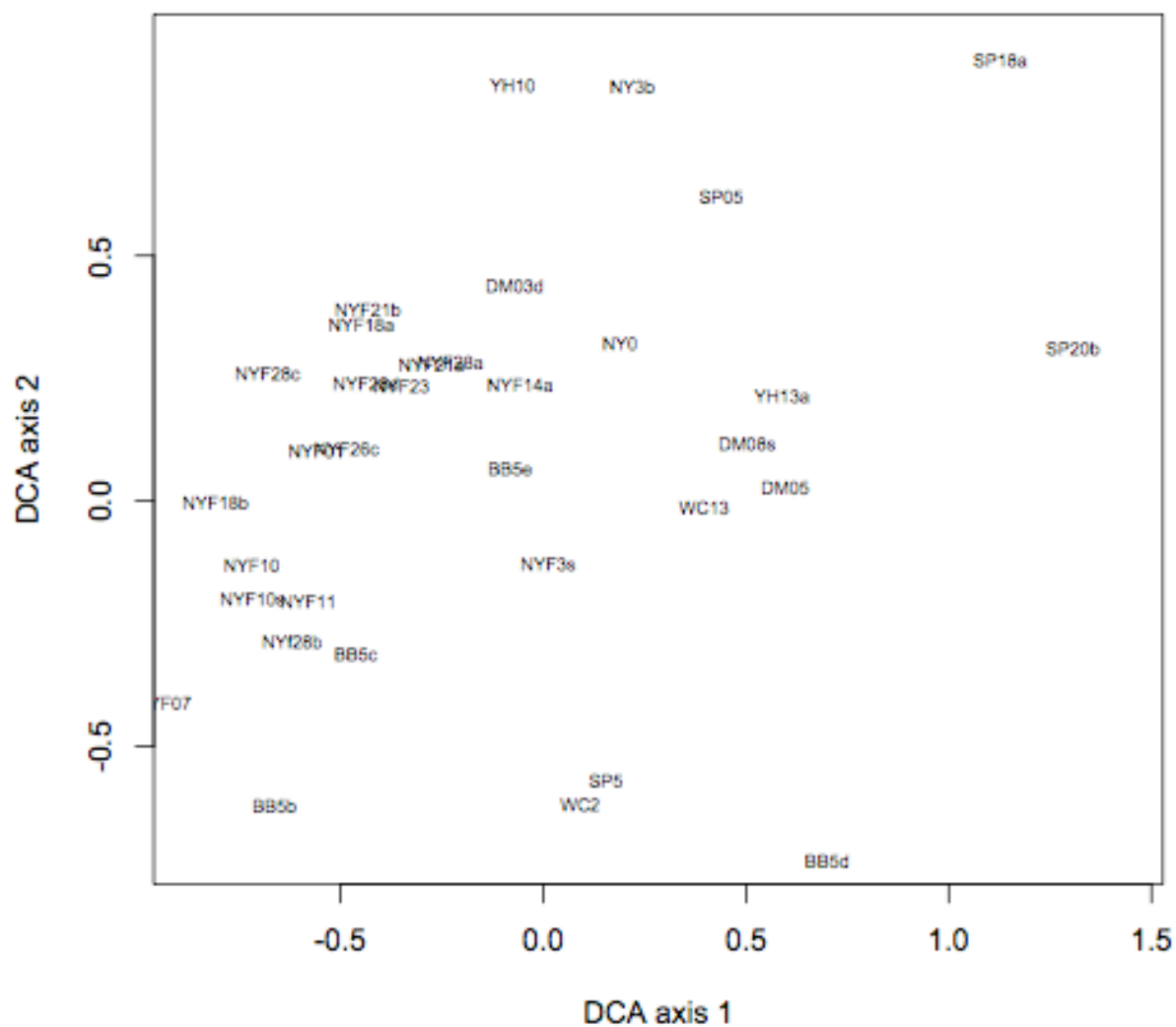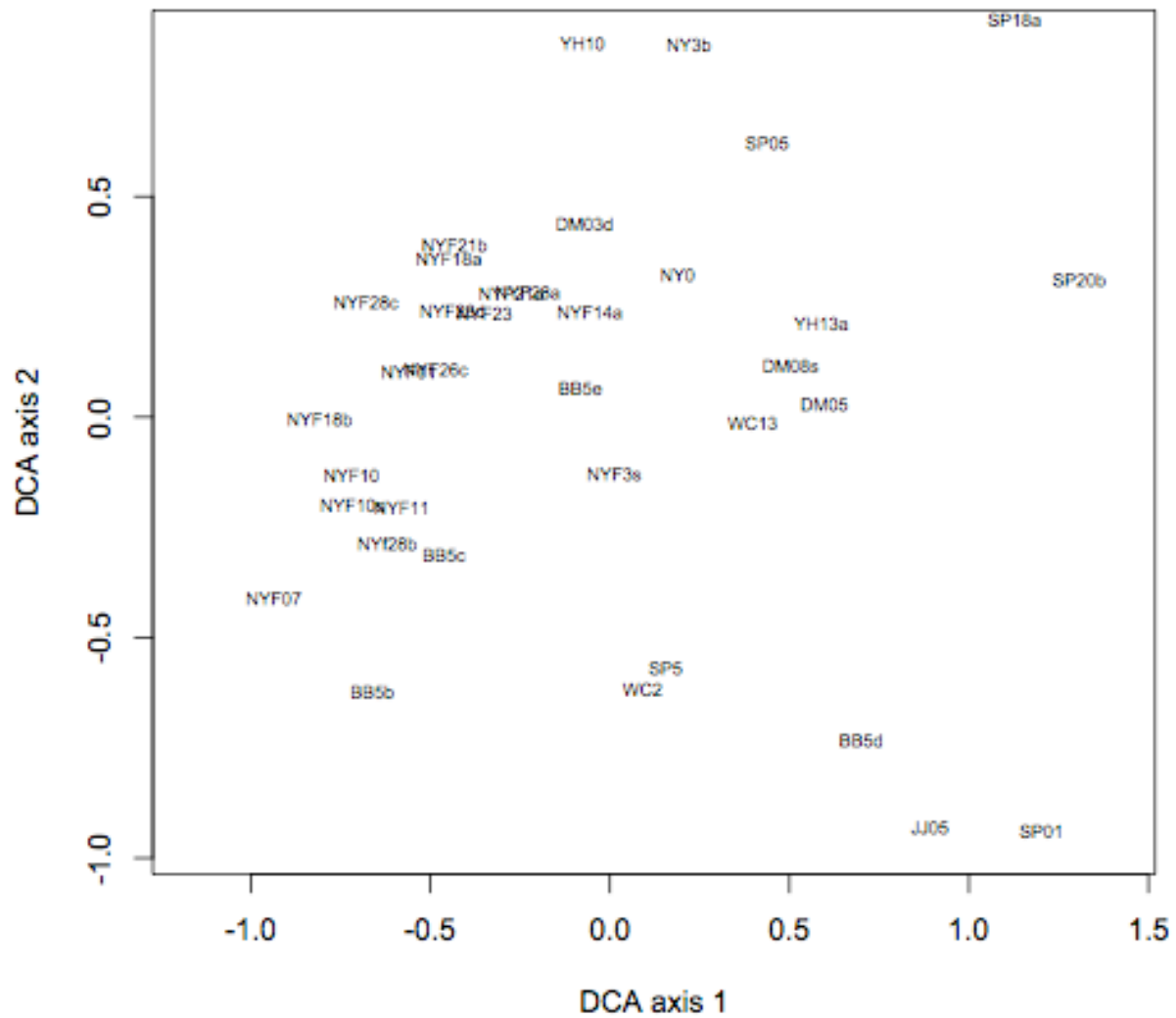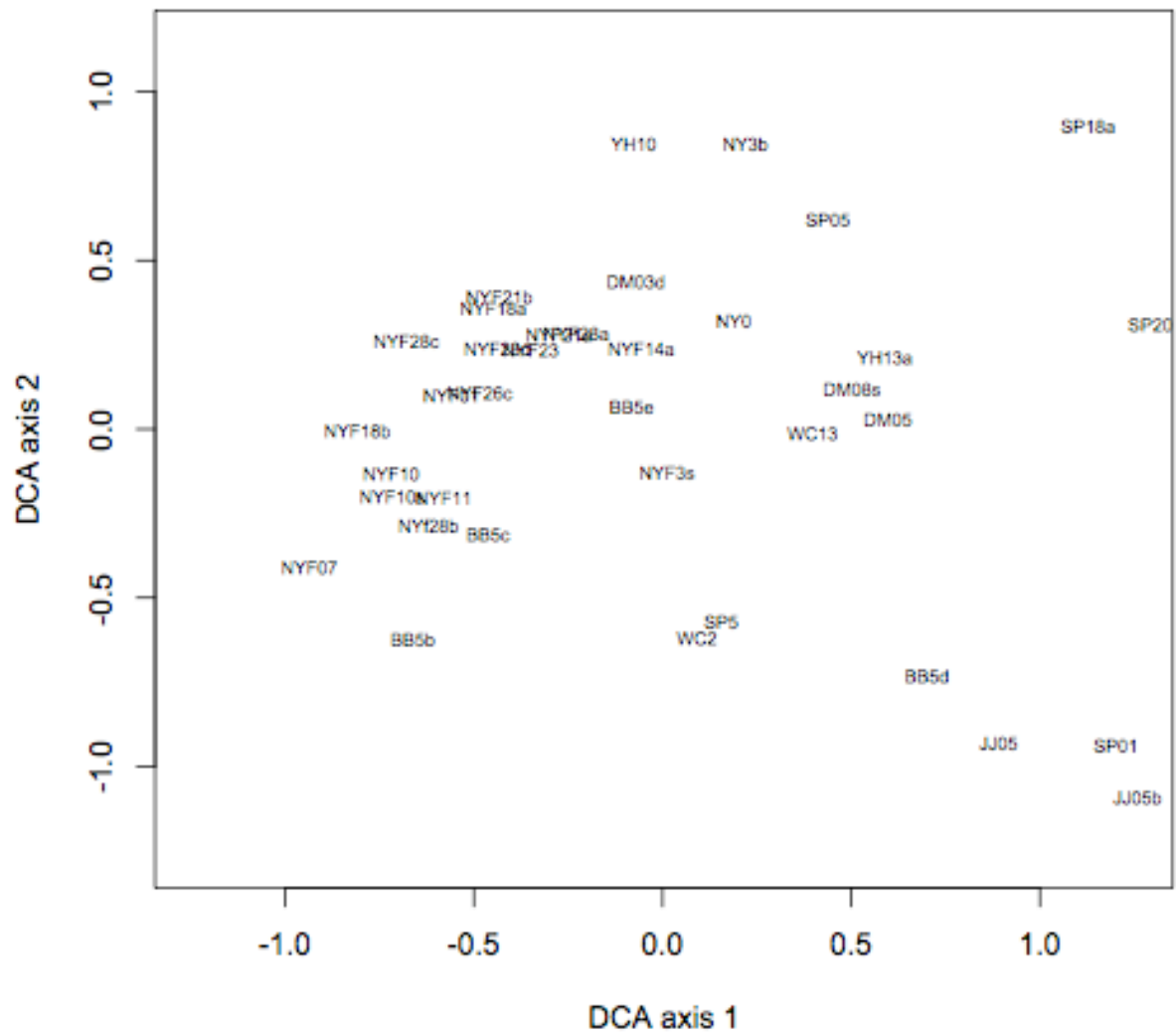
FIGURE A.4. Detrended correspondence analysis plot for benthic foraminifera of taphonomic grades T01-23. Text gives the sample name.
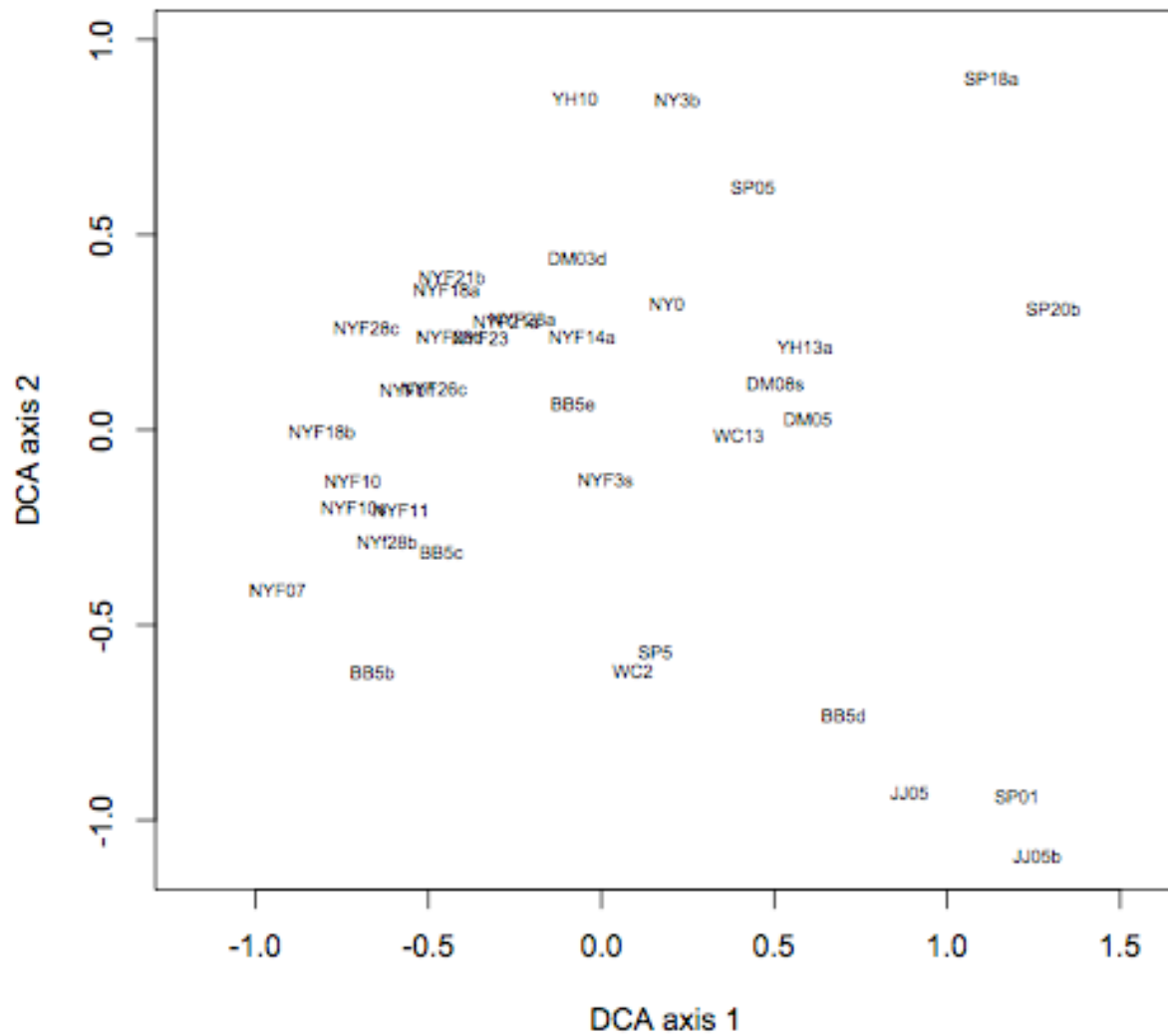
FIGURE A.5. Detrended correspondence analysis plot for benthic foraminifera of taphonomic grades T01-23-45. Text gives the sample name.

FIGURE A.6. Detrended correspondence analysis plot for benthic foraminifera of taphonomic grades T23-45. Text gives the sample name.

FIGURE A.7. Detrended correspondence analysis plot for benthic foraminifera of taphonomic grades T45. Text gives the sample name.

FIGURE A.8. Detrended correspondence analysis plot for benthic foraminifera of taphonomic grades T23. Text gives the sample name.