SABINE LAKE, TEXAS
BENTHIC COMMUNITY ASSESSMENT

SUBMITTED TO

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NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE
OFFICE OF OCEAN RESOURCES, CONSERVATION AND ASSESSMENT
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INTRODUCTION

Sabine Lake, Texas was sampled during August, 1995. One aspect of this evaluation was benthic community characterization, which was accomplished via sample collection by National Oceanic and Atmospheric Administration (NOAA) personnel and laboratory and data analysis by Barry A. Vittor & Associates, Inc. (BVA).

METHODS

Sample Collection And Handling

A Young dredge (area = 0.04 m^2) was used to collect replicate bottom samples at each of 22 stations in Sabine Lake, Texas. Macroinfaunal samples were sieved through a 0.5–mm mesh screen and preserved with 10% formalin on ship. Macroinfaunal samples were transported to BVA's laboratory in Mobile, Alabama.

Sediment Analysis

Sediment texture was determined at half-phi intervals using the hydrometer technique for fractions smaller than 44 µm and nested sieves for larger particle fractions. Texture parameters computed included percent gravel, sand, and silt /clay. Total organic carbon (TOC) content was measured as ash-free dry weight expressed as a percentage.

Macroinfaunal Sample Analysis

In the laboratory of BVA, benthic samples were inventoried, rinsed gently through a 0.5 mm mesh sieve to remove preservatives and sediment, stained with Rose Bengal, and stored in 70% isopropanol solution until processing. Sample material (sediment, detritus, organisms) was placed in white enamel trays for sorting under Wild M-5A dissecting microscopes. All macroinvertebrates were carefully removed with forceps and placed in labelled glass vials containing 70% isopropanol. Each vial represented a major taxonomic group (*e.g.,* Polychaeta, Mollusca, Arthropoda). All sorted macroinvertebrates were identified to the lowest practical identification level (LPIL), which in most cases was to species level unless the specimen was a juvenile, damaged, or otherwise unidentifiable. The number of individuals of each taxon, excluding fragments, was recorded. A voucher collection was prepared, composed of representative individuals of each species not previously encountered in samples from the region.

DATA ANALYSIS

All data generated as a result of laboratory analysis of macroinfauna samples were first coded on data sheets. Enumeration data were entered for each species according to station and replicate. These data were reduced to a data summary report for each station, which included a taxonomic species list and benthic community parameters information. Archive data files of species identification and enumeration were prepared.

The QA and QC reports for the Sabine Lake samples are given in the Appendix.

The analytical methodologies utilized for this study were similar to those used in other benthic community characterization reports prepared for NOAA. Macroinfaunal characterization involves an evaluation of several biological community structure parameters (*e.g.*, species abundance, species composition and species diversity indices) during initial data reduction, followed by pattern and classification analysis for delineation of taxa assemblages. Since species are distributed along environmental gradients, there are generally no distinct boundaries between communities. However, the relationships between habitats and species assemblages often reflect the interactions of physical and biological factors and indicate major ecological trends.

Assemblage Structure

Several numerical indices were chosen for analysis and interpretation of the macroinfaunal data. Selection was based primarily on the ability of the index to provide a meaningful summary of data, as well as the applicability of the index to the characterization of the benthic community. Infaunal abundance is reported as the total number of individuals per station and the total number of individuals per square meter (= density). Taxa richness is reported as the total number of taxa represented in a given station collection.

Taxa diversity, which is often related to the ecological stability and environmental "quality" of the benthos, was estimated by the Pielou's Index (Pielou, 1966), according to the following formula:

$$H' = -\sum_{i=1}^{s} p_i(\mathit{ln}\ p_i)$$

where, S = is the number of taxa in the sample,
i = is the i'th taxa in the sample, and
p_i = is the number of individuals of the i'th taxa divided by the total number of individuals in the sample.

Taxa diversity within a given community is dependent upon the number of taxa present (taxa richness) and the distribution of all individuals among those taxa (equitability or evenness). In order to quantify and compare faunal equitability to taxa diversity for a given area, Pielou's Index J' (Pielou, 1966) was calculated as $J' = H'/\mathit{ln}\ S$, where $\mathit{ln}\ S = H'_{max}$, or the maximum possible diversity, when all taxa are represented by the same number of individuals;

thus, $J' = H'/H'_{max.}$

Macroinfaunal data were graphically and statistically analyzed to identify any differences in density between stations. Data for total density were variously transformed and tested for normality (Shapiro-Wilk W; SAS Institute, 1995). Data could not be normalized with standard transformations [*e.g.,* ln(x+1), √(x+1)] and were analyzed using non-parametric methods (SAS Institute, 1995).

Faunal Similarities

Numerical classification analysis (Boesch 1977) was performed on the faunal data to examine within- and between- stations differences at the Sabine Lake stations and to compare faunal composition at each station within the site. Both normal and inverse classification analyses were used in this study. Normal analysis (sometimes called Q-analysis) treats samples as individual observations, each being composed of a number of attributes (*i.e.* the various taxa from a given sample). Normal analysis is instructive in helping to ascertain community structure and to infer specific ecological conditions between sampling stations from the relative distributions of species. Inverse classification (termed R-analysis) is based on taxa as individuals, each of which is characterized by its relative abundance in the various samples. This type of analysis is commonly used to identify species groupings with particular habitats or environmental conditions.

Classification analysis of both station collections (normal analysis) and taxa (inverse analysis) was performed using the Czekanowski quantitative index of faunal similarity (Field and MacFarlane 1968). This index is computationally equivalent to the Bray-Curtis similarity measure (Bray and Curtis 1957). The value of the similarity index is 1.0 when two samples are identical and 0 when no taxa are in common. Hierarchical clustering of similarity values is achieved using the group-average sorting strategy (Lance and Williams 1967) and displayed in the form of dendrograms.

Both similarity classification and cluster analysis were performed using the microcomputer package, “Community Analysis System 5.0” (Bloom 1994), as modified for use in BVA’s benthic data management program. Taxa used in these analyses were selected according to their percent abundance and percent frequency. Total densities for each of the selected taxa at a given station were log-transformed [$x=\ln(x+1)$] for the analysis.

HABITAT CHARACTERISTICS

Sediment data for the 22 stations are given in Table 1 and Figures 1, 2, and 3. Sediment composition at the 22 stations varied considerably from 96.4% sand at Station 1 to 66% clay at Station 66 (Table 1; Fig. 1); however, the sediment at all stations except 1, 22, 37, 45 and 56 was dominated by the silt/clay fraction (Fig. 2). The total organic carbon (TOC) fraction of the sediment was uniformly low and ranged from 0.38% at Station 50 to 3.88% at Station 1 (Table 1; Fig. 3).

BENTHIC COMMUNITY CHARACTERIZATION

Faunal Composition, Abundance, And Community Structure

Table 2 provides a complete phylogenetic listing for all stations as well as data on taxa abundance and station occurrence. Four Microsoft ™Excel 5.0 (Macintosh version) spreadsheets are being provided separately to NOAA which include: raw data on taxa abundance and density by replicate, a complete taxonomic listing with station abundance and occurrence and QA/QC comments, a major taxa table with overall taxa abundance, and an assemblage parameter table including data on mean number of taxa, mean density, taxa diversity and taxa evenness by station.

A total of 3,263 organisms, representing 77 taxa, were identified from the 22 stations (Table 3). Polychaetes were the most numerous organisms present representing 51.5% of the total assemblage, followed in abundance by oligochaetes (23.6%), bivalves (10.6%) and gastropods (9.2%). Polychaetes represented 37.7% of the total number of taxa followed by malacostracans (24.7%) and bivalves (13.0%) (Table 3). The percentage abundance of the major taxa at the 22 stations is given in Figure 4. Fifteen stations were dominated by annelids, while the remaining seven stations were dominated by molluscs (Fig. 4).

Table 1. Summary of sediment and benthic macroinfaunal data for the Sabine Lake stations, August 1995.

Station	Total No. Taxa	Mean Taxa per Repl.	Total No. Indivs.	Density (nos/m^2)	Density (Std. Dev.)	H'	J'	% Gravel	% Sand	% Silt	% Clay	TOC	Textural Description
1	4	1.6	17	142.0	104.0	0.96	0.69	0.49	96.40	0.61	0.00	1.26	sand
4	6	3.3	712	5933.0	4245.0	0.19	0.11	0.00	16.59	35.16	48.25	3.88	silty clay
7	10	5.3	36	300.0	217.0	1.93	0.84	0.00	10.26	34.64	55.10	3.56	clay
10	1	0.3	1	8.0	14.0	–	–	0.00	7.59	41.28	51.13	2.46	clay
15	14	8.7	197	1642.0	813.0	1.59	0.60	0.00	4.57	53.96	41.47	2.44	silty clay
16	5	3.0	31	258.0	210.0	1.13	0.70	0.00	8.81	45.50	45.69	2.78	silty clay
21	10	6.7	156	1300.0	218.0	1.45	0.63	0.00	6.97	44.46	48.57	2.96	silty clay
22	11	5.0	58	483.0	345.0	1.24	0.52	0.00	69.93	21.48	8.58	0.95	silty sand
26	8	4.0	63	525.0	156.0	0.99	0.48	0.00	10.14	42.26	47.60	2.08	silty clay
29	7	4.0	168	1400.0	214.0	0.51	0.26	0.00	5.13	36.38	58.48	2.48	clay
31	3	1.7	308	2567.0	167.0	0.04	0.04	0.00	3.12	45.50	51.38	2.18	clay
34	12	6.3	126	1050.0	1516.0	0.95	0.38	1.03	29.46	30.78	38.73	2.43	sandy clay
37	20	1.3	268	2233.0	719.0	2.12	0.71	0.07	68.54	24.85	6.54	0.95	silty sand
41	10	7.3	62	517.0	95.0	1.93	0.84	0.13	26.54	48.27	25.06	2.13	clayey silt
45	28	16.3	323	2692.0	586.0	2.47	0.74	0.03	69.05	25.29	5.63	0.95	silty sand
48	13	8.3	64	533.0	146.0	2.06	0.80	0.00	23.43	52.00	24.57	1.43	clayey silt
50	18	11.0	77	642.0	330.0	2.61	0.90	0.03	49.26	36.68	14.03	0.38	silty sand
53	20	11.0	107	892.0	218.0	2.35	0.78	0.00	44.38	38.44	17.18	1.54	sandy silt
56	24	12.0	133	1108.0	14.0	2.13	0.67	1.46	59.71	24.72	14.10	0.90	silty sand
58	5	9.0	67	558.0	359.0	0.80	0.50	0.00	4.12	52.08	43.80	1.90	silty clay
63	11	7.0	129	1075.0	363.0	1.76	0.73	0.00	4.49	39.72	55.79	2.15	clay
66	24	12.0	160	1333.0	557.0	2.28	0.72	0.00	1.19	32.41	66.39	1.73	clay

Figure 1. Sediment composition for the Sabine Lake stations, August 1995.

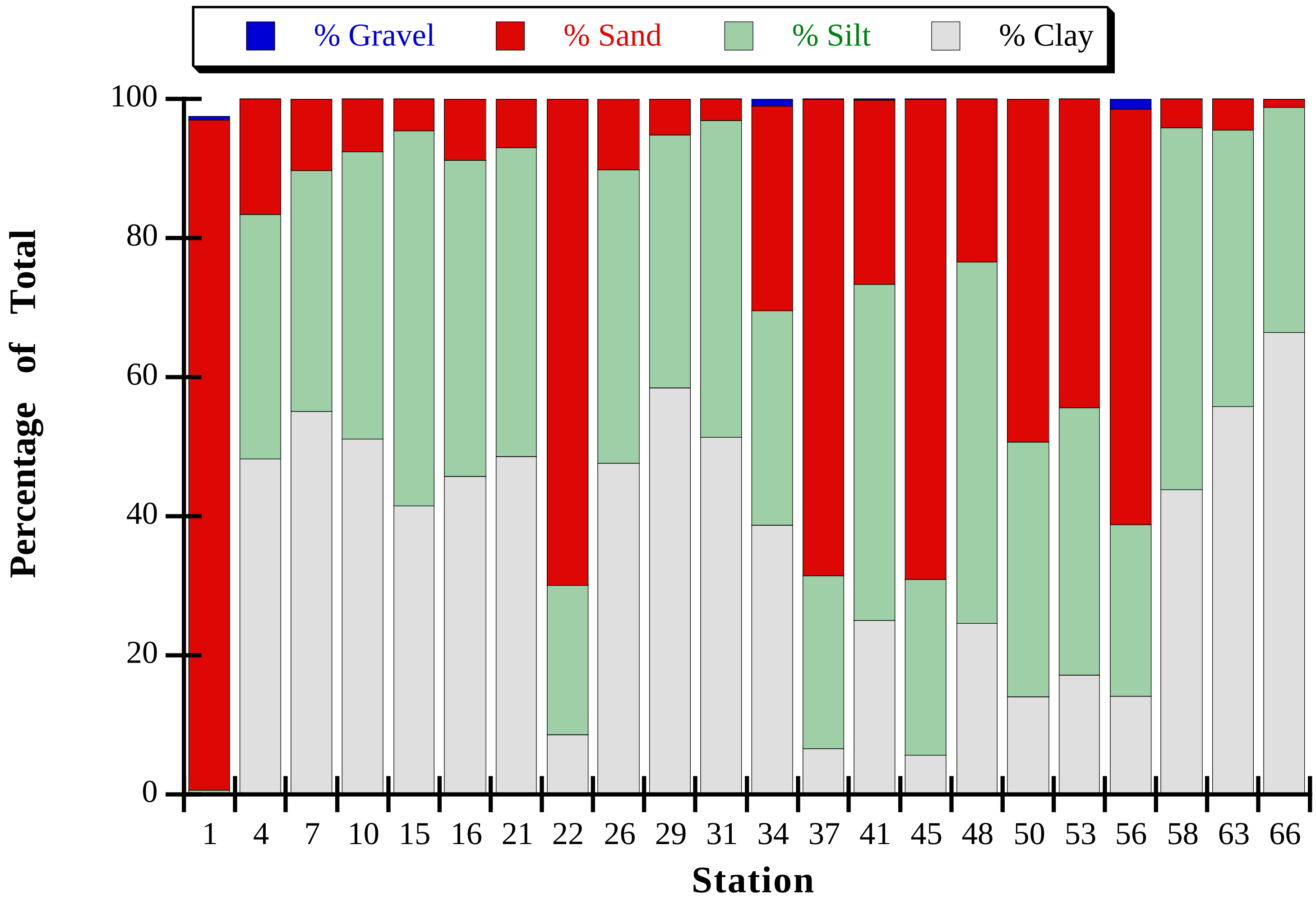


Figure 2. Percent sand/gravel and percent silt/clay content of the sediment for the Sabine Lake stations, August 1995.

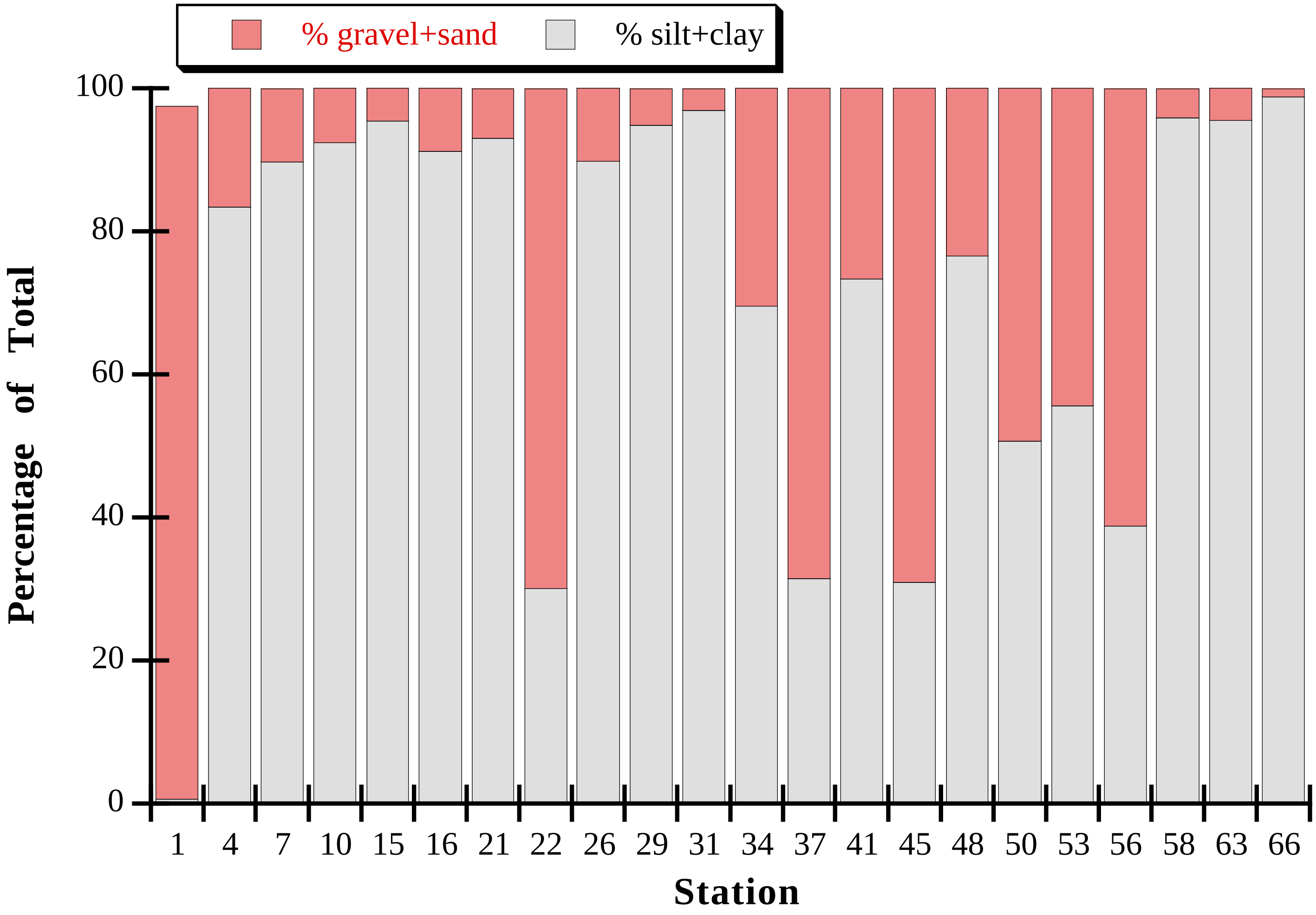


Figure 3. Percent total organic carbon (TOC) content of the sediments for the Sabine Lake stations, August 1995.

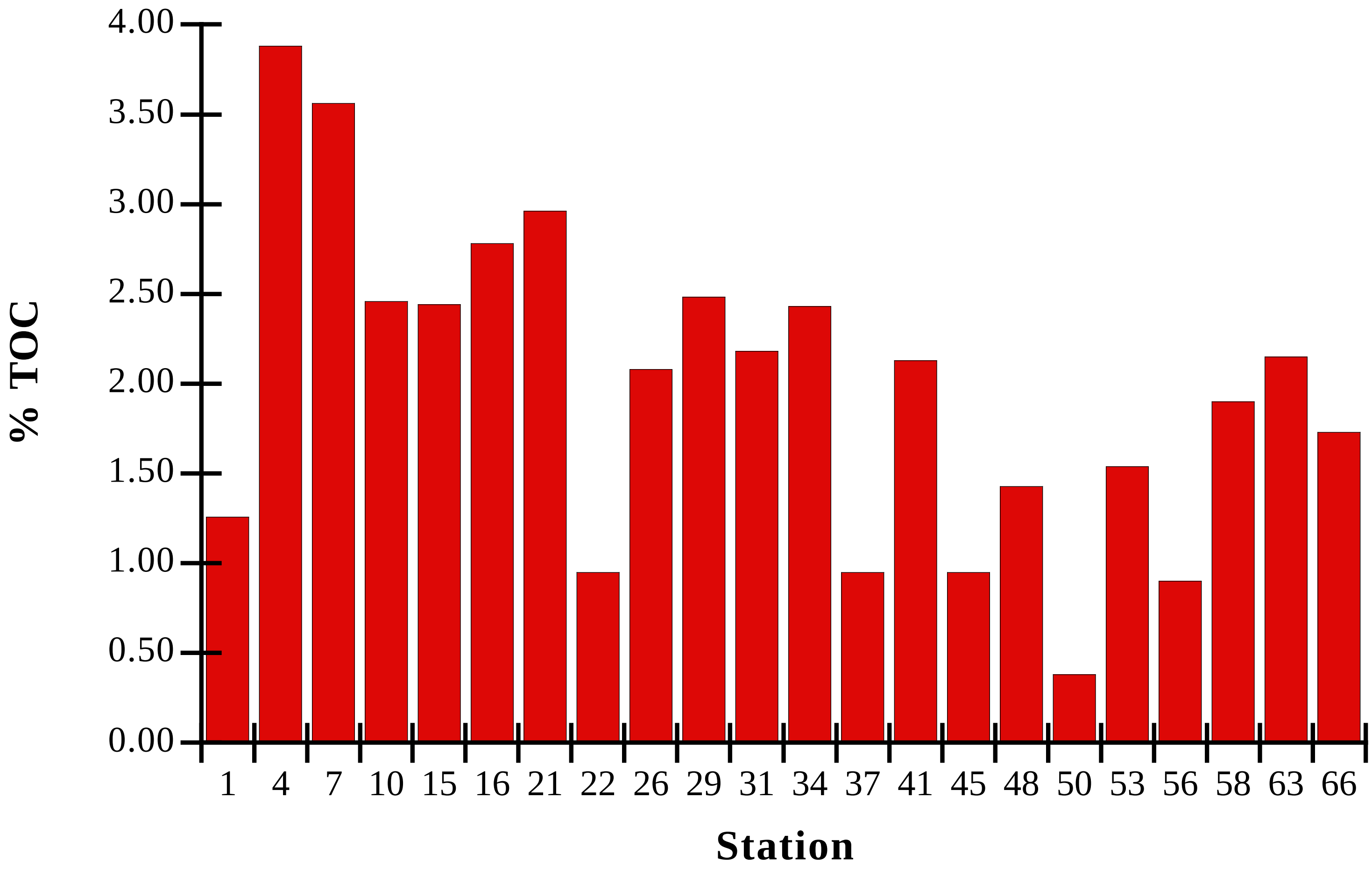


Table 2. Abundance and distribution of taxa for the Sabine Lake stations, August 1995. Taxa above the shaded line of data were included in the classification analysis.

Taxa	Phylum	Class	No. of Individuals	% of Total	Cumulative %	Station Occur.	% Station Occur.	Comment
Paraprionospio pinnata	A	Poly	947	29.02	29.02	13	59.1	
Tubificoides heterochaetus	A	Olig	756	23.17	52.19	13	59.1	
Mediomastus (LPIL)	A	Poly	252	7.72	59.91	15	68.2	anterior portions only, probably *M. ambiseta*, pygidium needed for species ID
Rangia cuneata	M	Biva	169	5.18	65.09	8	36.4	
Texadina sphinctostoma	M	Gast	142	4.35	69.44	7	31.8	
Parandalia tricuspis	A	Poly	128	3.92	73.37	14	63.6	
Hydrobiidae (LPIL)	M	Gast	125	3.83	77.20	10	45.5	crushed shell and/or juvenile specimen
Streblospio benedicti	A	Poly	107	3.28	80.48	13	59.1	
Mactridae (LPIL)	M	Biva	84	2.57	83.05	4	18.2	juvenile specimen
Mytilopsis leucophaeata	M	Biva	78	2.39	85.44	4	18.2	
Rhynchocoela (LPIL)	R		63	1.93	87.37	12	54.5	no identifible characters
Paramphinome sp.B	A	Poly	59	1.81	89.18	6	27.3	
Sigambra tentaculata	A	Poly	43	1.32	90.50	6	27.3	
Gastropoda (LPIL)	M	Gast	23	0.70	91.20	4	18.2	crushed and/or immature specimen
Mediomastus ambiseta	A	Poly	19	0.58	91.78	4	18.2	
Coelotanypus (LPIL)	Ar	Inse	17	0.52	92.31	6	27.3	4th instar, associated pupae, or adult needed for species ID
Callianassidae (LPIL)	Ar	Mala	16	0.49	92.80	6	27.3	missing major cheliped
Nereidae (LPIL)	A	Poly	15	0.46	93.26	6	27.3	missing identificaton characters and/or immature
Glycinde solitaria	A	Poly	15	0.46	93.72	7	31.8	
Hobsonia florida	A	Poly	14	0.43	94.14	6	27.3	
Tubificidae (LPIL)	A	Olig	12	0.37	94.51	4	18.2	sexually immature
Aoridae (LPIL)	Ar	Mala	11	0.34	94.85	2	9.1	lacking appendages
Cossura soyeri	A	Poly	11	0.34	95.19	3	13.6	
Balanoglossus (LPIL)	He	Ente	10	0.31	95.49	1	4.5	fragment
Polydora cornuta	A	Poly	10	0.31	95.80	4	18.2	
Nereis (LPIL)	A	Poly	9	0.28	96.07	4	18.2	incomplete specimen, posterior portion necessary for species identification
Pelecypoda (LPIL)	M	Biva	9	0.28	96.35	4	18.2	crushed and/or juvenile specimen
Xanthidae (LPIL)	Ar	Mala	9	0.28	96.63	6	27.3	missing appendages
Laeonereis culveri	A	Poly	8	0.25	96.87	2	9.1	
Lineidae (LPIL)	R	Anop	6	0.18	97.06	2	9.1	family is lowest identification level
Cryptochironomus (LPIL)	Ar	Inse	6	0.18	97.24	3	13.6	4th instar, associated pupae, or adult needed for species ID
Ampharetidae (LPIL)	A	Poly	5	0.15	97.39	5	22.7	missing identificaton characters and/or immature
Spionidae (LPIL)	A	Poly	5	0.15	97.55	1	4.5	missing identificaton characters and/or immature
Odostomia (LPIL)	M	Gast	5	0.15	97.70	3	13.6	immature and/or fragmented portion only
Capitella capitata	A	Poly	5	0.15	97.85	2	9.1	
Magelona sp. H	A	Poly	5	0.15	98.01	2	9.1	
Nassarius (LPIL)	M	Gast	4	0.12	98.13	1	4.5	immature and/or fragmented portion only
Stenoninereis martini	A	Poly	4	0.12	98.25	1	4.5	
Dipolydora socialis	A	Poly	4	0.12	98.37	4	18.2	
Actiniaria (LPIL)	Cn	Anth	3	0.09	98.47	2	9.1	order is lowest identification level
Magelona (LPIL)	A	Poly	3	0.09	98.56	2	9.1	incomplete specimen, posterior portion necessary for species identification
Oedicerotidae (LPIL)	Ar	Mala	3	0.09	98.65	3	13.6	appendages missing and/or damaged
Capitellidae (LPIL)	A	Poly	2	0.06	98.71	1	4.5	
Oligochaeta (LPIL)	A	Olig	2	0.06	98.77	1	4.5	
Corophium (LPIL)	Ar	Mala	2	0.06	98.83	2	9.1	
Almyracuma (LPIL)	Ar	Mala	2	0.06	98.89	1	4.5	
Diopatra cuprea	A	Poly	2	0.06	98.96	1	4.5	
Podarkeopsis levifuscina	A	Poly	2	0.06	99.02	2	9.1	
Hargeria rapax	Ar	Mala	2	0.06	99.08	2	9.1	
Callinectes sapidus	Ar	Mala	2	0.06	99.14	2	9.1	
Crassostrea virginica	M	Biva	2	0.06	99.20	1	4.5	
Phoronis (LPIL)	Ph		1	0.03	99.23	1	4.5	
Goniadidae (LPIL)	A	Poly	1	0.03	99.26	1	4.5	
Nuculana (LPIL)	M	Biva	1	0.03	99.29	1	4.5	
Ampelisca (LPIL)	Ar	Mala	1	0.03	99.32	1	4.5	
Mysidae (LPIL)	Ar	Mala	1	0.03	99.35	1	4.5	
Decapoda Reptantia (LPIL)	Ar	Mala	1	0.03	99.38	1	4.5	
Pinnixa (LPIL)	Ar	Mala	1	0.03	99.42	1	4.5	
Chironomus (LPIL)	Ar	Inse	1	0.03	99.45	1	4.5	
Hemiptera (LPIL)	Ar	Inse	1	0.03	99.48	1	4.5	
Corixidae (LPIL)	Ar	Inse	1	0.03	99.51	1	4.5	
Ogyrides alphaerostris	Ar	Mala	1	0.03	99.54	1	4.5	
Grandidierella bonnieroides	Ar	Mala	1	0.03	99.57	1	4.5	
Polymesoda caroliniana	M	Biva	1	0.03	99.60	1	4.5	
Nuculana concentrica	M	Biva	1	0.03	99.63	1	4.5	
Squilla empusa	Ar	Mala	1	0.03	99.66	1	4.5	
Brachidontes exustus	M	Biva	1	0.03	99.69	1	4.5	
Owenia fusiformis	A	Poly	1	0.03	99.72	1	4.5	
Ancistrosyllis jonesi	A	Poly	1	0.03	99.75	1	4.5	
Corophium lacustre	Ar	Mala	1	0.03	99.78	1	4.5	
Lepidophthalmus louisianensis	Ar	Mala	1	0.03	99.81	1	4.5	
Nereis micromma	A	Poly	1	0.03	99.84	1	4.5	
Aulodrilus pigueti	A	Olig	1	0.03	99.88	1	4.5	
Ischadium recurvum	M	Biva	1	0.03	99.91	1	4.5	
Caulleriella sp. J	A	Poly	1	0.03	99.94	1	4.5	
Edotia triloba	Ar	Mala	1	0.03	99.97	1	4.5	
Cerapus tubularis	Ar	Mala	1	0.03	100.00	1	4.5	

TAXA KEY

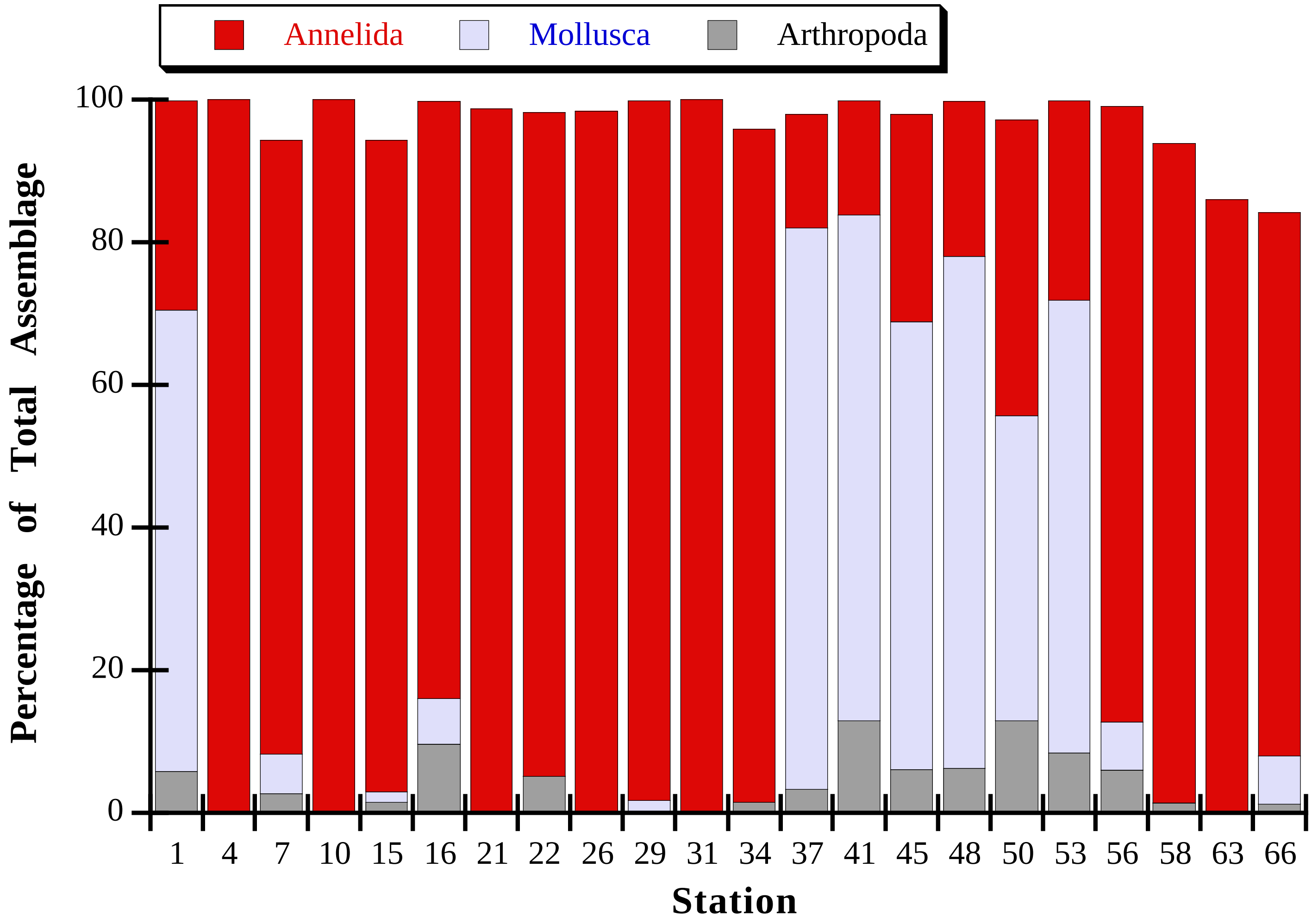
Phylum
Class

A = Annelida
Olig = Oligochaeta
Poly = Polychaeta
Ar = Arthropoda
Inse = Insecta
Mala = Malacostraca
Cn = Cnidaria
Anth = Anthozoa
He = Hemichordata
Ente = Enteropneusta
M = Mollusca
Biva = Bivalvia
Gast = Gastropoda
Ph = Phoronida
R = Rhynchocoela
Anop = Anopla

Table 3. Summary of abundance of major taxonomic groups for the Sabine Lake stations, August 1995.

Taxa	Total No. Indivs.	% Total	Total No. Taxa	% Total
Annelida				
Polychaeta	1679	51.5	29	37.7
Oligochaeta	771	23.6	4	5.2
Arthropoda				
Malacostraca	58	1.8	19	24.7
Insecta	26	0.8	5	6.5
Mollusca				
Bivalvia	347	10.6	10	13.0
Gastropoda	299	9.2	5	6.5
Miscellaneous	83	2.5	5	6.5
TOTAL	**3263**		**77**	

Figure 4. Percent abundance of major taxa for the Sabine Lake stations, August 1995.



The dominant taxa collected from the samples were the polychaete, *Paraprionospio pinnata*, the oligochaete, *Tubificoides heterochaetus*, the polychaete, *Mediomastus* (LPIL) and the bivalve, *Rangia cuneata* representing 29.0%, 23.2%, 7.7% and 5.2% of the total number of individuals, respectively (Table 2). The oligochaete, *T. heterochaetus* was found at 59% of the stations, but 91% of the individuals were found at Station 4. The polychaetes, *Mediomastus* (LPIL) and *Parandalia tricuspis* were the most widely distributed taxa being found at 68.2% and 63.6% of the stations, respectively (Table 2). The distribution of dominant taxa representing >10% of the total assemblage at each station is given in Table 4.

Station mean density and mean number of taxa data are given in Table 1 and Figures 5 and 6. Mean densities ranged from 8 organisms$\cdot$m^{-2} at Station 10 to 5933 organisms$\cdot$m^{-2} at Station 4 (Table 1; Fig. 5). The mean number of taxa per replicate ranged from 1 at Station 10 to 16.3 at Station 45 (Table 1; Fig. 6).

There was a positive correlation between station mean density data and total taxa per replicate (Table 5; Fig. 7). There was a significant positive correlation between the number of taxa per replicate and sediment TOC (Table 5; Fig. 8). There were additional significant correlations between physical parameters: % gravel + sand was inversely correlated with % silt + clay and TOC; and % silt + clay was positively correlated with TOC (Table 5).

Taxa diversity and evenness are given in Table 1 and Figure 9. Taxa diversity (H’) ranged from 0.04 at Station 31 (diversity could not be calculated for Station 10 with only one taxon present) to 2.61 at Station 50. Taxa evenness (J') values ranged from 0.04 at Station 31 (evenness could not be calculated for Station 10 with only one taxon present) to 0.90 at Station 50 (Table 1; Fig. 9).

Numerical Classification Analysis

Table 4. Percentage abundance of dominant taxa (> 10% of the total) for the Sabine Lake stations, August 1995.

	STATION																				
Taxa	**1**	**4**	**7**	**10**	**15**	**16**	**21**	**22**	**26**	**29**	**31**	**34**	**37**	**41**	**45**	**48**	**50**	**53**	**56**	**58**	**63**	**66**
Rhynchocoela (LPIL)																						11.9
Polychaeta																						
Glycinde solitaria			11.1																			
Mediomastus (LPIL)			13.9		56.9	58.1		10.4									14.3		21.8			10.0
Paramphinome sp. B																				10.5	17.1	
Parandalia tricuspis						25.8								14.5					26.3			
Paraprionospio pinnata			38.9				50.6	69.0	73.0	89.3	99.4	78.6							25.6	77.6	45.7	34.4
Sigambra tentaculata									14.3													11.3
Stenoninereis martini	23.5																					
Streblospio benedicti							26.9															
Oligochaeta																						
Aulodrilus pigueti				100.0																		
Tubificoides heterochaetus		96.6			11.2																	
Gastropoda																						
Gastropoda (LPIL)	64.7																					
Hydrobiidae (LPIL)													11.2		20.7		11.7					
Texadina sphinctostoma													12.7	11.3	13.3	28.1	14.3	23.4				
Pelecypoda																						
Mactridae (LPIL)													29.5									
Rangia cuneata													22.0	32.3	14.2	23.4	11.7	16.8				
Mytilopsis leucophaeata														14.5	13	12.5		17.8				
Diptera																						
Coelotanypus (LPIL)														11.3								

Figure 5. Mean macroinvertebrate densities for the Sabine Lake stations, August 1995.

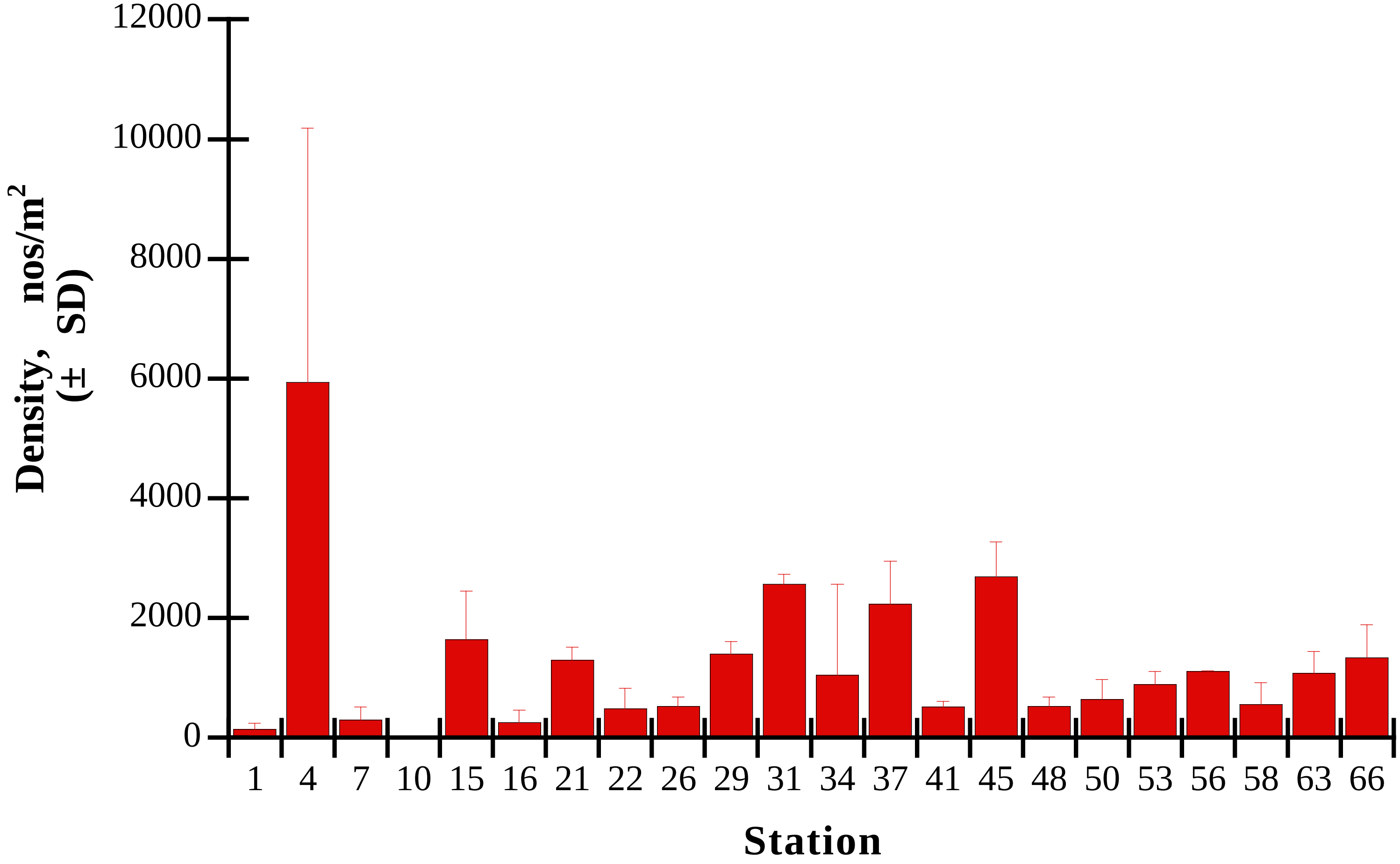


Figure 6. Mean number of macroinvertebrate taxa per replicate for the Sabine Lake stations, August 1995.

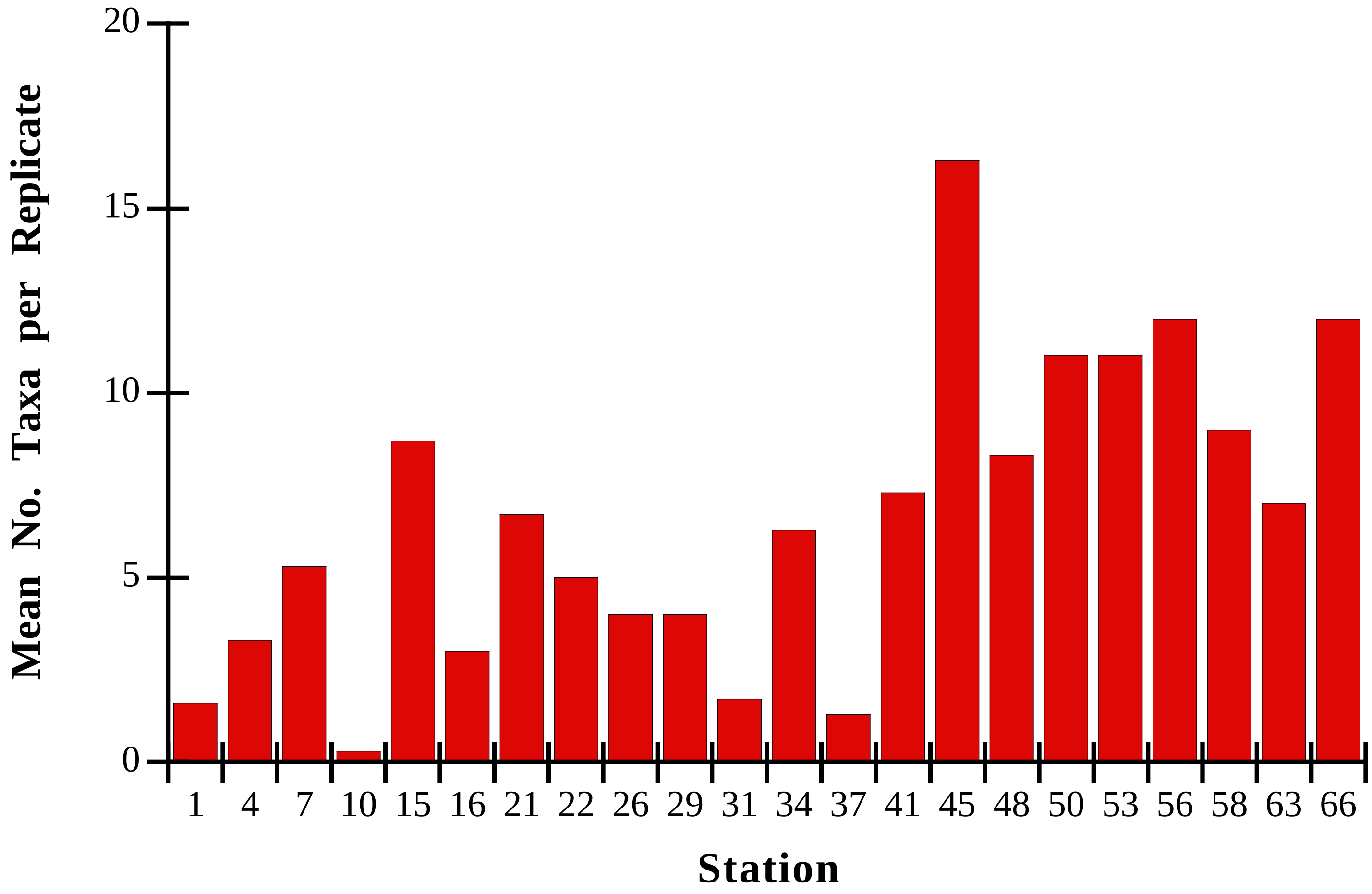


Table 5. Correlation coefficients for the Sabine Lake data, August 1995.

Variable	by Variable	Correlation Spearman's Rho	Significance Probability
Density	total taxa	0.3979	0.0667
	% gravel + sand	-0.1903	0.3963
	% silt + clay	0.1903	0.3963
	% TOC	0.0141	0.9502
Total Taxa	% gravel + sand	0.3396	0.1221
	% silt + clay	-0.3396	0.1221
	% TOC	-0.5711	0.0055
% Gravel + Sand	% silt + clay	-1.0000	0.0000
	% TOC	-0.5806	0.0046
% Silt + Clay	% TOC	0.5806	0.0046

Figure 7. Mean macroinvertebrate densities versus the mean number of macroinvertebrate taxa per replicate for the Sabine Lake stations, August 1995.

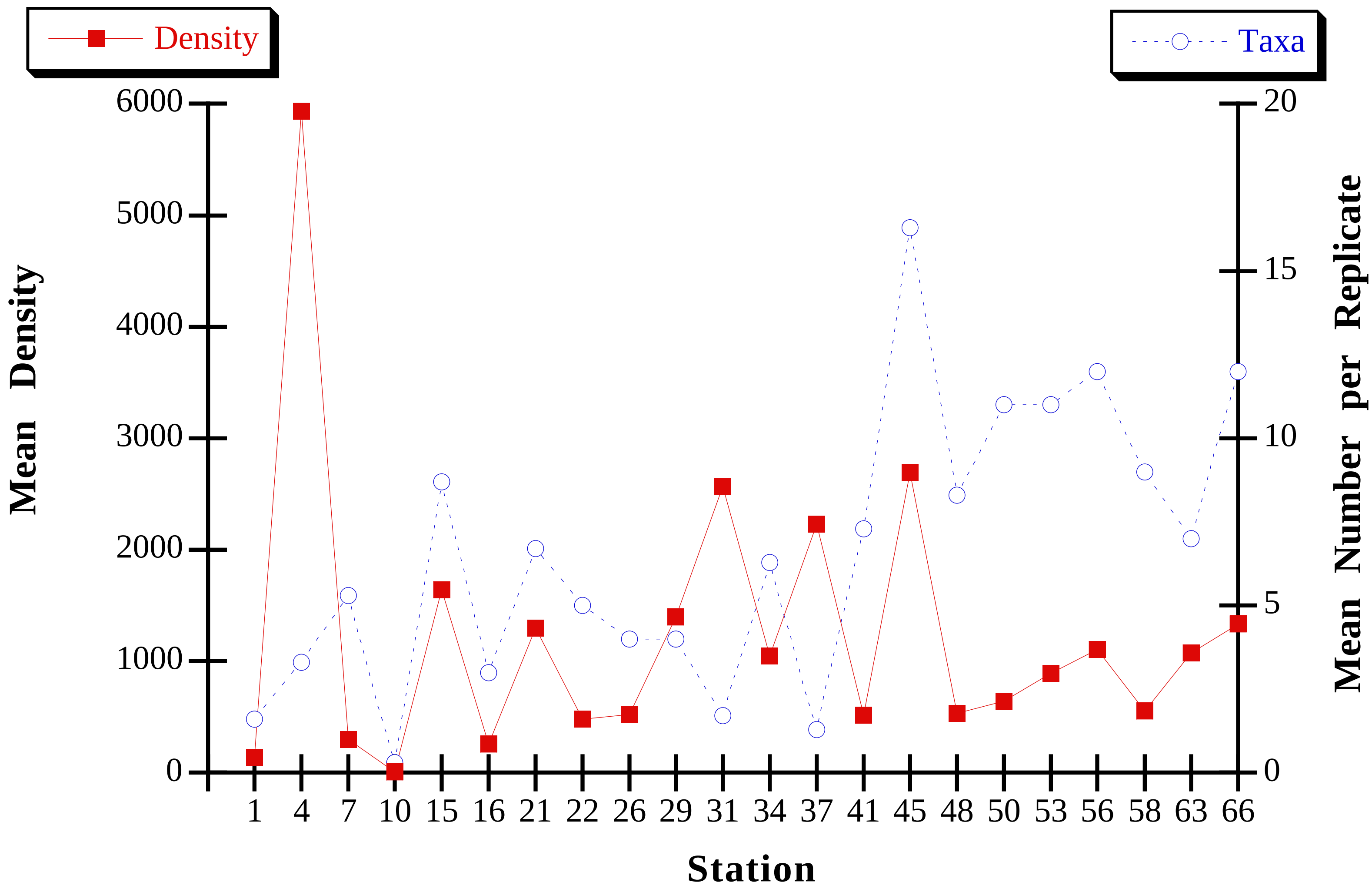


Figure 8. Mean number of macroinvertebrate taxa per replicate versus percent sediment total organic carbon (TOC) for the Sabine Lake stations, August 1995.

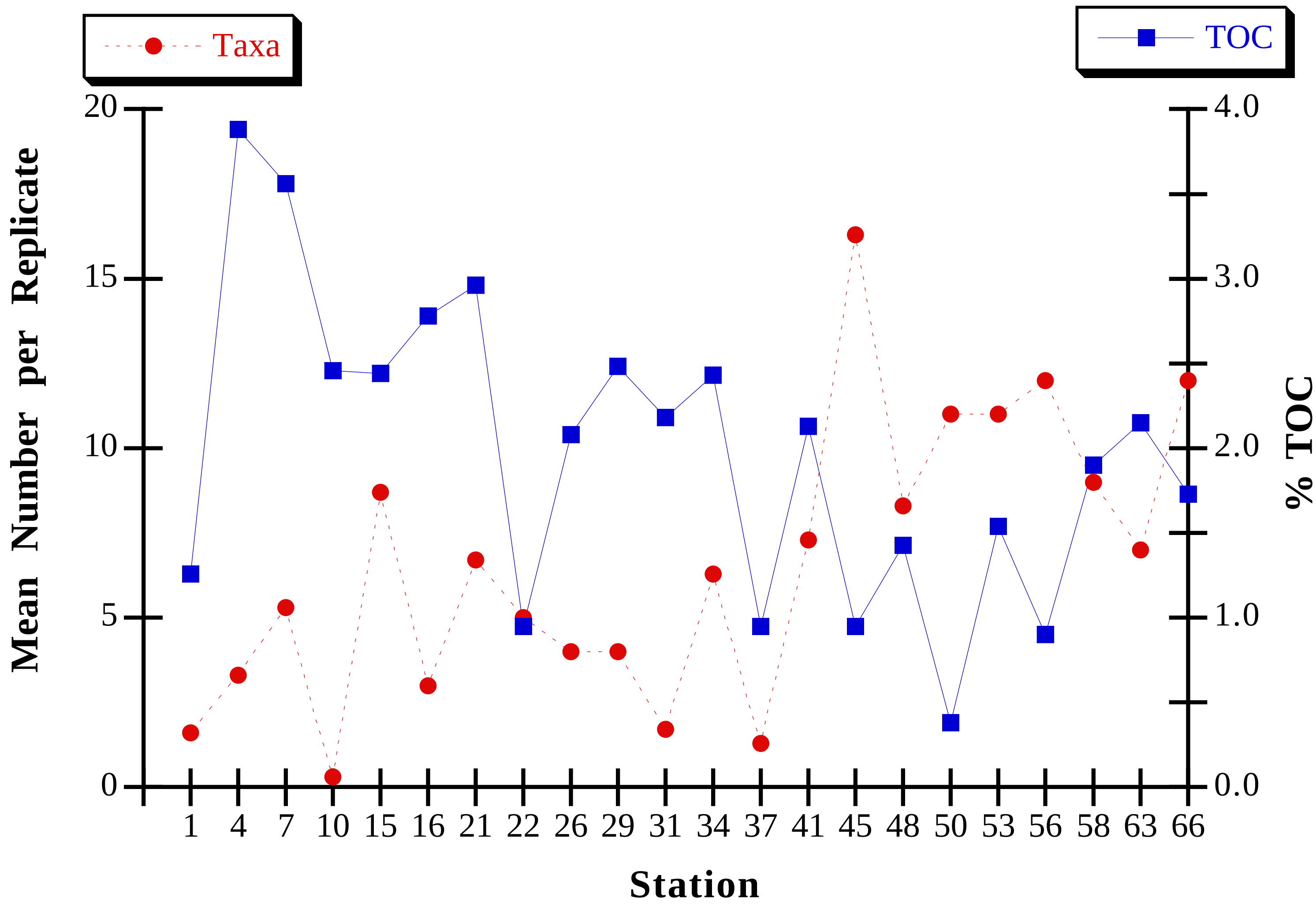
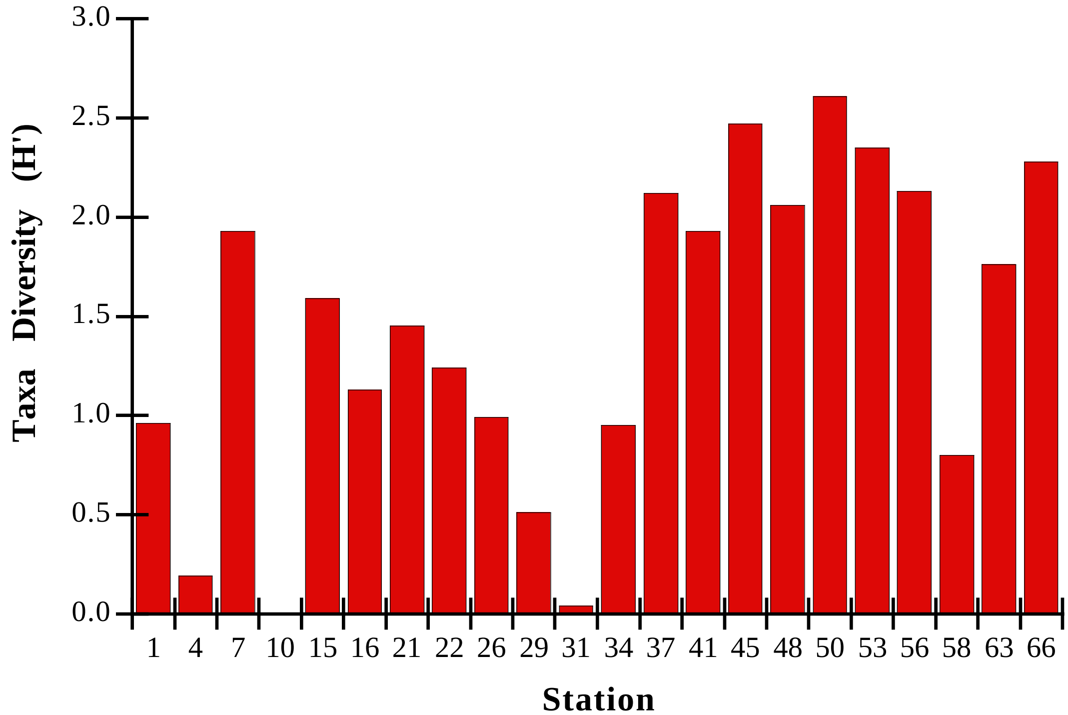
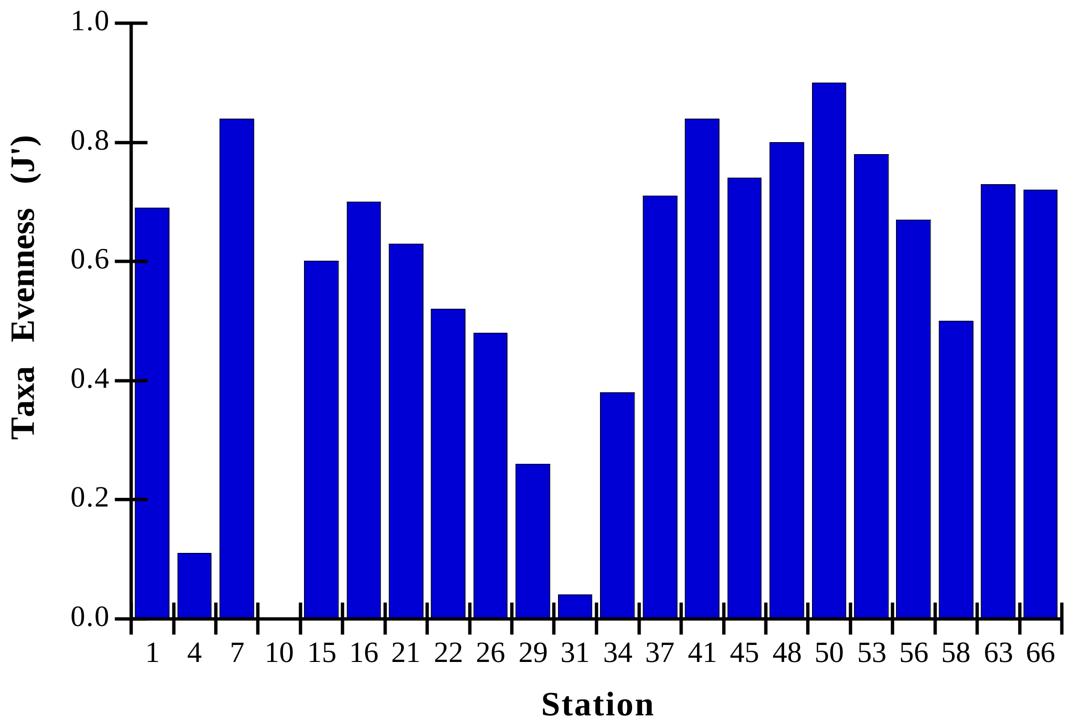


Figure 9. Taxa diversity (H') and taxa evenness (J') for the Sabine Lake stations, August 1995.





Normal (station) and inverse (species) classification analyses were performed on the Sabine Lake data set and displayed as dendrograms (Figs. 10 and 11). Selection of the species included in the analyses was based on a minimum representation of 0.09% of total individuals. Count data for the 42 taxa selected were included in a matrix of station and species groups (Table 6). These taxa accounted for 98.7% of the total macroinfaunal assemblage.

Numerical classification of the 22 stations can be interpreted at a five-group level (≈ 1 – 23% level of similarity). Group A contained only Station 10 with one taxa represented by one individual. Group B was represented by Station 1 which was the only station to have the polychaete taxon, *Stenoninereis martini* present (Table 6). Group C contained Stations 16, 37, 41, 45, 48, 50 and 53 which were dominated by molluscan taxa (Table 6; Fig. 10). Group D contained only Station 4 with high densities of the oligochaete, *Tubificoides heterochaetus* (Table 6). Group E contained the remaining stations which were dominated by annelids, particularly the polychaete *Paraprionospio pinnata* (Table 6; Fig. 10).

Classification of the 42 taxa at the 22 stations could be interpreted at a 7–group level (≈ 1 – 23% similarity; Table 6 and Fig. 11). Groups A, B, D, E and H and were represented by either one or two taxa which were found at a small number of stations (Fig. 11). Group C included taxa found primarily at Stations 63 and 66. Group F included numerous annelid taxa found across most stations (Table 6; Fig. 11). Taxa Group G contained a diverse array of molluscan taxa collected from Stations 16, 37, 41, 45, 48, 50 and 53 (Table 6; Fig. 11).

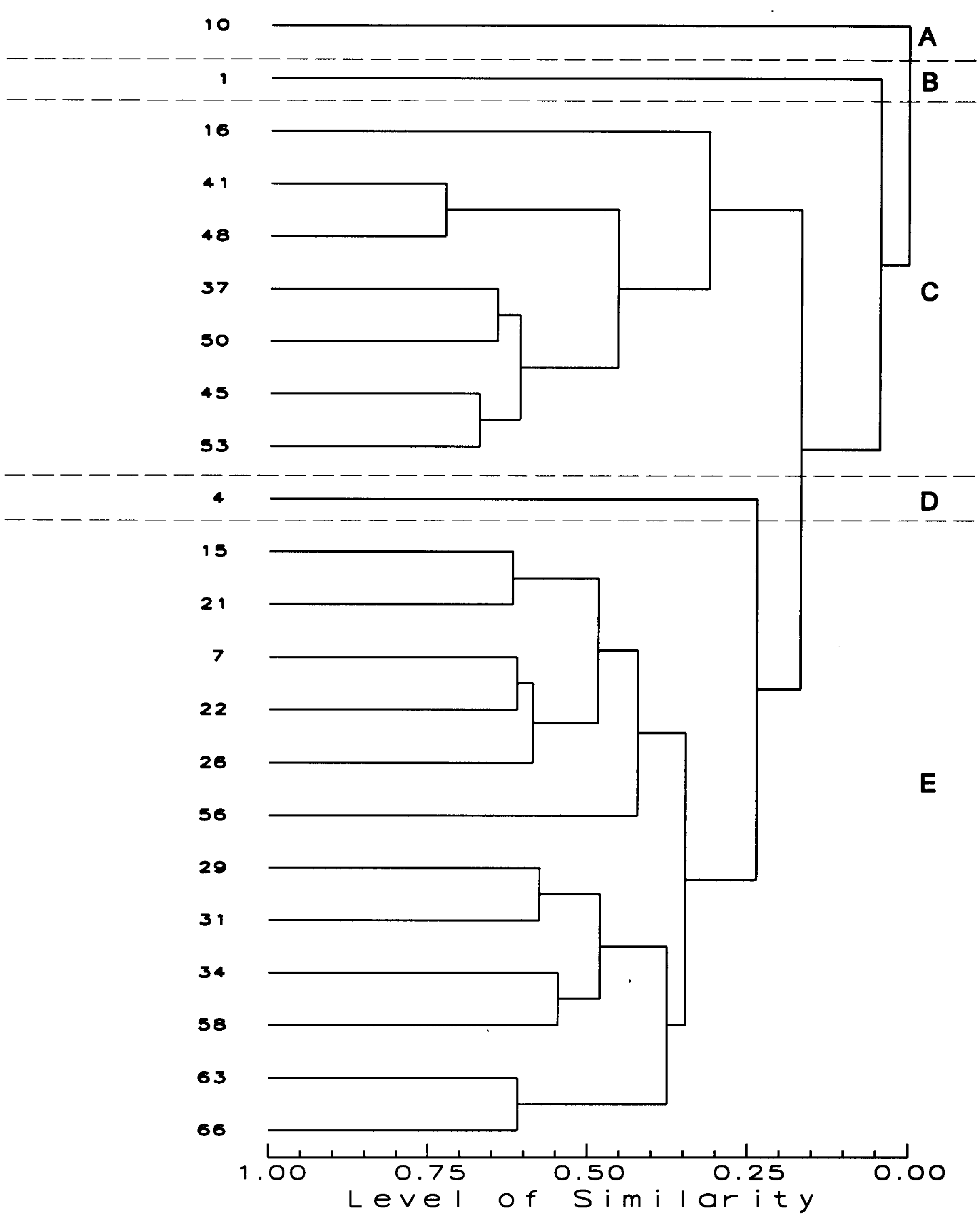


Figure 10. Normal (station) classification analysis for the Sabine Lake stations. Large, bolded letters (A, B, C) denote station groupings.

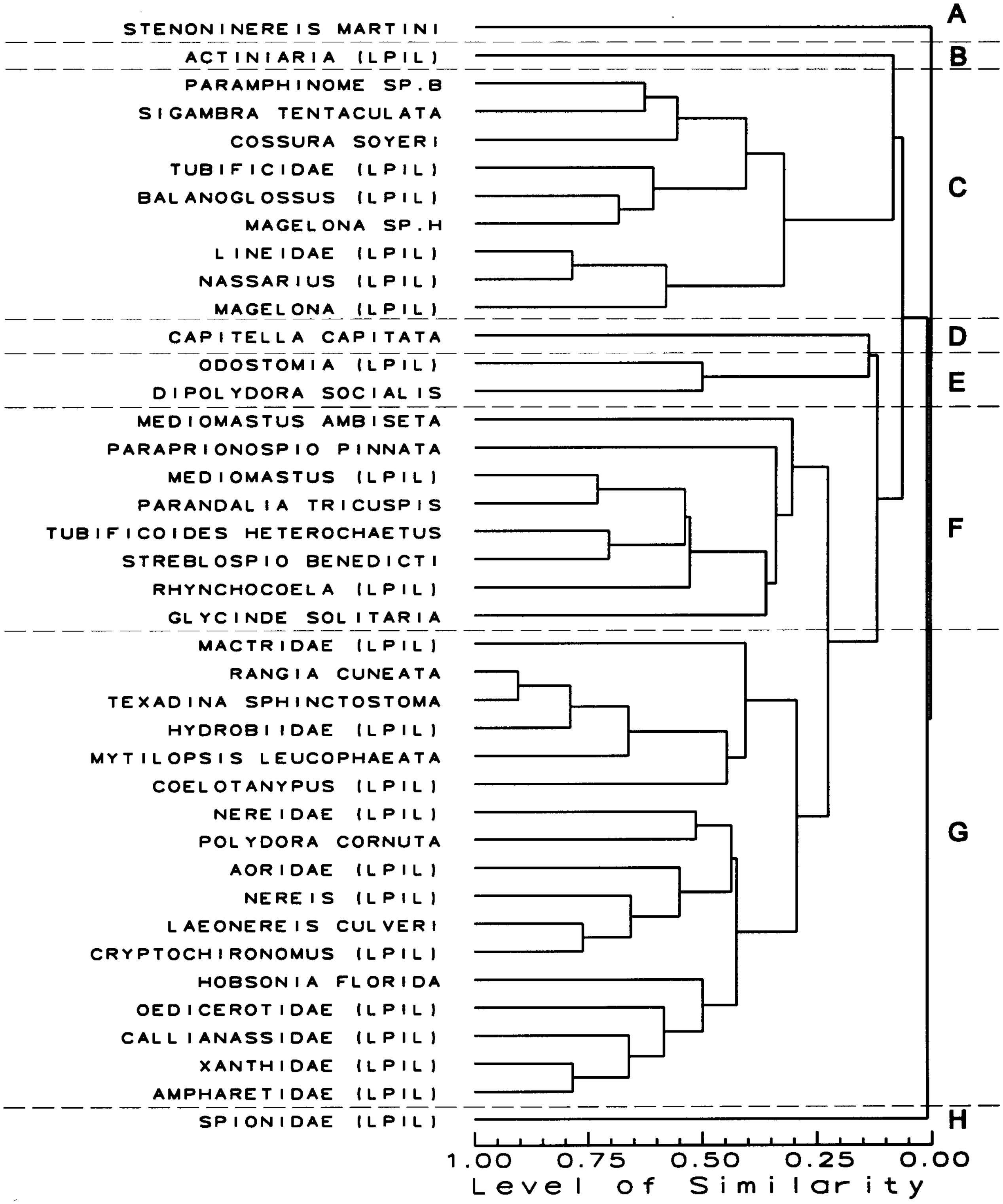


Figure 11. Inverse (taxa) classification analysis for the Sabine Lake stations. Large, bolded letters (A, B, C) denote taxa.

Table 6. Data matrix of the Sabine Lake station and taxa groups compiled from classification analysis dendrograms.

	A	B	C							D	E												
	10	1	16	41	48	37	50	45	53	4	15	21	7	22	26	56	29	31	34	58	63	66	
Stenonineris martini		4																					A
Actiniaria (LPIL)															1				2				B
Paramphinome spB																2	2		11	7	22	15	
Sigambra tentaculata															9		3	1	2		10	18	
Cossura soyeri																	2				4	5	
Tubificidae (LPIL)								1				3									7	1	
Balanoglossus (LPIL)																					10		C
Magelona sp.H																					4	1	
Lineidae (LPIL)																			1			5	
Nassarius (LPIL)																						4	
Magelona (LPIL)																					1	2	
Capitella capitata											1					4							D
Odostomia (LPIL)				1	1												3						E
Dipolydora socialis				1	1							1				1							
Mediomastus ambiseta								1			10	7					1						
Paraprionospio pinnata										3	10	79	14	40	46	34	150	306	99	52	59	55	
Mediomastus (LPIL)			18		1	5	11	29	9	1	112	6	5	6	1	29					3	16	
Parandalia tricuspis			8	9	6	10	6	30	5		5	7	1	4	1	35			1				
Tubificoides heterochaetus						19	2	5	3	688	22	8	2	1	1	1		1		3			F
Streblospio benedicti		1				4	4	5	8	13	16	42	3	1	2	1	7						
Rhynchocoela (LPIL)						5	2	6			11	2	2	1		1			2	4	8	19	
Glycinde solitaria								1			3		4	1	2	1						3	
Mactridae (LPIL)				2		79		2	1														
Rangia cuneata				20	15	59	9	46	18		1					1							
Texadina sphinctostoma				7	18	34	11	43	25							4							
Hydrobiidae (LPIL)			2	5	2	30	9	67	5		2		2			1							
Mytilopsis leucophaeata				9	8			42	19														
Coelotanypus (LPIL)			2	7	3		2		1		2												
Nereidae (LPIL)						4	3	4						1					2			1	
Polydora cornuta							3	5				1				1							
Aoridae (LPIL)						1		10															G
Nereis (LPIL)								5	1							1			2				
Laeonereis culveri								6	2														
Cryptochironomus (LPIL)					1			4	1														
Hobsonia florida					5		2	1	1							4						1	
Oedicerotidae (LPIL)						1		1	1														
Callianassidae (LPIL)						3	5	1	2							4				1			
Xanthidae (LPIL)						1	2	2	2							1			1				
Ampharetidae (LPIL)						1	1	1	1							1							
Spionidae (LPIL)										5													H

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APPENDIX

QUALITY ASSURANCE STATEMENT

Client/Project: NOAA

Work Assignment Title: Sabine Lake, 1995

Work Assignment Number: NOAA–95–MR Task Number: 6

Description of Data Set or Deliverable: 66 benthic macroinvertebrate samples collected in August, 1995; Young Dredge grabs.

Description of audit and review activities: Judged accuracy rates were well above standard levels for sorting and taxonomy. Laboratory QC reports were completed. Copies of reports and QC results follow (see attachment). All taxonomic data were entered into computer and printed. This list was checked for accuracy against original taxonomic data sheets.

Description of outstanding issues or deficiencies which may affect data quality: None

____

Signature of QA Officer or Reviewer Date

____

Signature of Project Manager Date

QUALITY CONTROL REWORKS

Client/Project: NOAA
Work Assignment Title: Sabine Lake, 1995
Work Assignment Number: NOAA–95–MR Task Number: 6

Sorting Results:

Sample #	% Accuracy
37-002	100%
21-001	100%
63-001	100%
50-003	100%
48-002	100%
15-001	100%
50-002	100%
45-002	100%
10-003	100%

Taxonomy Results:

Sample #	Taxa	% Accuracy
01-002	Crust./Moll.	100%
07-002	Crust./Moll.	100%
37-001	Crust./Moll.	98%
53-003	Crust./Moll.	100%
56-003	Crust./Moll.	100%
29-001	Crust./Moll.	100%
15-002	Crust./Moll.	100%
15-002	Poly./Misc.	100%
07-001	Poly./Misc.	100%
04-003	Poly./Misc.	100%
63-002	Poly./Misc.	100%
34-001	Poly./Misc.	99%
53-003	Poly./Misc.	100%
16-002	Poly./Misc.	100%

Description of outstanding issues or deficiencies which may affect data quality: None

Signature of QA Officer or Reviewer Date