



Investigating Biodiversity in the Peconic River Brody Timoney, Vincent Milano, John Samartino, John Swicicki **Eastport South Manor Junior-Senior High School**

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Abstract

Our goals are supposed to identify samples to measure biodiversity if any are invasive. The general health of the Peconic River can be measured with biodiversity. We successfully barcoded 4 species. We identified that sample DFG-003 is a species of leech in the Erpobdellidae family, DFG-004 is a m of freshwater snail called Campeloma decisum, DFG-006 is a Springtime Darner dragonfly identified as Basiaeschna janata. DFG-018 is a clam species in the genus Pisidium. The species

Results

Table 1: Barcodes of Identified Species





could not be positively confirmed.

Introduction

DNA barcoding is a way of comparing genes to identify species in a lab. Also to compare genes. It was developed in 2003 and it was made by Paul Herberts research group. Some practical applications for barcoding include pest and disease control, food production and safety, resource management, biodiversity conservation, and education.

The biodiversity of the Peconic River can be measured by DNA barcoding. Estuaries are an important part of life on Earth because many different organisms rely on it for habitat and reproduction. Most of the fish and shellfish eaten in the United States, including salmon, herring, and oysters, complete at least part of their life cycles in estuaries. We plan to measure the biodiversity levels in the Peconic River using DNA Barcoding. Our Hypothesis is that the biodiversity of the peconic river can be measured by DNA Barcoding.

Materials and Methods

6. MK208640.1 erpobdella_mexicana						
7. DFG-003						
8. MN436005.1 Jerpobdellidae_sp.						
9. AF116025.1 mooreobdella_melanos	te					
10. KM611949.1 erpobdellidae_sp.						

Table 2: Sequence Similarity

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	С	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		С	1	2	3	4	5	6	7	8	9	10
С	-	73.23	73.19	73.36	72.88	72.11	72.42	92.77	95.38	95.08	95.23	94.74	95.31	94.77	94.77	93.69	С	-	89.01	89.32	89.32	89.32	89.17	83.72	84.18	83.97	83.00	82.82
1	73.23	-	100.00	100.00	94.76	94.76	95.07	68.22	69.46	69.30	69.46	68.69	69.53	69.15	68.37	67.91	1	00.01		00.22	00.52	00.52	00.27	70.60	70.16	72.00	71.00	71 74
2	73.19	100.00	-	100.00	94.76	94.76	95.07	68.22	69.46	69.30	69.46	68.69	69.53	69.15	68.37	67.91	1	89.01	-	99.22	99.53	99.53	99.37	12.08	/3.10	73.09	/1.90	/1./4
3	73.36	100.00	100.00	2	94.70	94.70	95.02	68.39	69.64	69.48	69.64	68.86	69.53	69.33	68.54	68.08	2	89.32	99.22	-	99.69	99.69	99.53	72.68	73.16	73.09	72.06	71.90
4	72.88	94.76	94.76	94.70	-	96.15	96.46	68.37	70.23	70.08	70.23	69.00	69.70	69.15	68.53	68.22	3	89.32	99.53	99.69	-	100.00	99.84	72.68	73.16	73.09	72.06	71.90
5	72.11	94.76	94.76	94.70	96.15	-	99.23	67.29	69.15	68.99	69.15	67.76	68.18	67.75	67.29	66.98	4	89.32	99.53	99.69	100.00		99.84	72.68	73.16	73.09	72.06	71.90
6	72.42	95.07	95.07	95.02	96.46	99.23		67.60	69.46	69.30	69.46	68.07	68.35	68.06	67.60	67.29	5	89.17	99.37	99.53	99.84	99.84	-	72.53	73.00	72.93	71.90	71.74
7	92.77	68.22	68.22	68.39	68.37	67.29	67.60	-	91.54	91.54	91.38	91.19	91.62	91.08	91.38	90.46	6	83.72	72 68	72 68	72.68	72 68	72 53	-	88.02	87.46	86.40	86.22
8	95.38	69.46	69.46	69.64	70.23	69.15	69.46	91.54		99.69	99.85	91.96	91.12	90.77	91.08	90.31		00.12	12.00	12.00	12.00	12.00	12.00		00.02	01.40	00.40	00.22
9	95.08	69.30	69.30	69.48	70.08	68.99	69.30	91.54	99.69	-	99.85	92.27	91.12	90.77	90.77	90.31	7	84.18	73.16	73.16	73.16	73.16	73.00	88.02	-	99.84	92.27	92.11
10	95.23	69.46	69.46	69.64	70.23	69.15	69.46	91.38	99.85	99.85	-	92.12	90.95	90.62	90.92	90.46	8	83.97	73.09	73.09	73.09	73.09	72.93	87.46	99.84	-	92.22	92.06
11	94.74	68.69	68.69	68.86	69.00	67.76	68.07	91.19	91.96	92.27	92.12	-	94.14	93.97	93.97	94.44	9	83.00	71.90	72.06	72.06	72.06	71.90	86.40	92.27	92.22	12	99.69
12	95.31	69.53	69.53	69.53	69.70	68.18	68.35	91.62	91.12	91.12	90.95	94.14	-	97.32	96.15	93.97	10	82.82	71.74	71.90	71.90	71.90	71.74	86.22	92.11	92.06	99.69	-

Table 3: Images of identified samples



004 - C. decisium 003 - Erpobdella

006 - *B. janata* 018 - Pisidium

Hand-held and seine nets were used to collect macroinvertebrates from their habitat

After photographing samples were placed in ethanol tubes and froze them.

DNA sequences were analyzed with DNA Subway and BLAST to identify samples





Next, a piece of tissue was removed from



Table 3: Identified SamplesUsing DNA Barcoding

Sample Number	Species Name	Common Name	BIT Score	Number of Mismatches			
003	Erpobdellidae	Leech	1132	1			
004	Campeloma decisum	Freshwater Snail	1150	0			
006	Basiaeschna janata	Springtime Darner	1171	0			
018	Pisidium	clam	1087	19			

Discussion

The four species we barcoded have been identified using DNA Barcoding. Sample DFG-004 is a species named campeloma decisium which is a freshwater snail which are native to us. DFG-003 is a species called Erpobdellidae which is a leach that is native to many parts of the world in freshwater areas. DFG 006 is a springtime dragonfly species called a Springtime Darner (*Basiaeschna janata*). This species is native to us. DFG-018 is a clam species in the genus *Pisidium*. This species is native to us, but used to only be found in eastern Europe and Russia before they were imported to America.



each sample and DNA was extracted using the Chelex protocol

Future Directions

We are going to look into the DNA sequencing of the invertebrates and see what we are able to find that may be of interest, and to measure biodiversity, or possibly even a novel sequence.

References

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