

# The Fireflies

Isaac Pines and Yashoda Jaikaran

Long Beach HS

#### Abstract

The diversity of beetles on a barrier island will be studied. How does the type of food placed outside affect how beetles are attracted to it? There are approximately 400,000 species of beetles on the Earth. Around 40% of insect species are beetles. Beetles are very diverse and live almost everywhere on the earth except the polar regions. Pitfall traps and sweep netting will be used to capture the beetles. The beetles will then have their pictures taken from under a microscope to inspect and identify them. If unable to ID using keys then DNA barcoding protocol will be use

#### Introduction

Our research question focused on how type of food affects diversity of beetles attracted. If we set up different types of food around a wooded area, would different species of beetles will be attracted to specific nutrient lures? Beetles are a very diverse order and they have a big impact on our environment and we are excited to learn more about them.

### Materials & Methods

We used two methods of entrapment.. These two methods include pitfalls traps and net sweeping. For the pitfall traps we used a shovel to dig the holes, a pitfall trap (Bioquip Item #2838A) was set up using propylene glycol.

#### Results

The beetles were attracted to the protein the most. Pieces of chicken were used as a protein source., While our other groups of food like carbs and sugar attracted some beetles, the protein attracted the most. We also attracted other insects than beetles such as spiders, flies and worms, Additionally, the beetles that we collected included several different species, not one specific species were caught.

#### **Acknowledgements**

We would like to thank our mentor and instructor, Cody Onufrock, Sharon from DNALC and most of all, Barcode LI, Without them none of this would be possible.



PTJ-200/02



PT.I-06



PTJ-04

## Instructor: Cody Onufrock

#### **Tables and Figures**

Fig. 1 Map where samples were found



Number of Insects Collected Based on the Lure Use





#### Fig. 3 Phylogenetic Tree



#### Discussion





- 10-0	= back						
0.01	Accession #	¢ Details	e Aln. Length	* Score		¢ Mis- matches	
1(1)	MF545107.1	Desoceras reticulatum - Desoceras reticulatum voucher BIOUG07063-E05 cytochrome oxidaale subunit 1 (COI) gene, patial cds	655	1177	0.0	1	
8(7)	MF544966.1	Descenas reticulature - Descenas reticulature voucher BIOUG24538-007 cytochrome oxidase subunit 1 (COI) gene, partial cds	655	1177	0.0	1	
(3)	MF544870.1	Descena reticulature - Descena reticulature voacher BIOUS24518-D12 cytochrome oxidiase subunit 1 (COI) gene, partial cds	695	1177	0.0	1	
(4).	MF544812.1	Desoceras reticulatum - Desoceras reticulatum voucher BIOUG07961-ED6 cytochrome oxidaale subunit 1 (DOI) gene, partial cds	655	1177	0.0	1	
rJ-01	3 * back	Derocenas reticulatum - Derocenas reticulatum voucher					
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).	KJ561375.1	Mermessus fradeorum - Mermessus fradeorum cytochrome oxidase subunit 1 (CD1) gene, partial cds	c (53	1110		0.0	3
	🗎 КҮ269965.1	Memossus trilobatus - Memossus trilobatus voucher ZFMK-TIS-19087 cytochrome oxidase subunit 1 (COI)gene, patial cds	658	966		0.0	49
).	⊟ КУ269363.1	Mennessus trilobatus - Mermessus trilobatus voucher ZFMK-TIS-2758 cytochrome oxidase suburit 1 (COI)gene, patial cds	658	962		0.0	50
L	🗎 КҮ268679.1	Memossus trilobatus - Memossus trilobatus voucher ZEMK-DNA-100415491 cytochrome oxidase subunit 1 (COI) gene, partial cds	658	962		0.0	50
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8	Accession #	¢ Details	An. Leigh	Score	0 e	¢ Mir	s- Aches
(1).	HQ978644.1	Demaptera sp. BOLD:AAG9897 - Demaptera sp. BOLD:AAG9897 voucher BIOUG-/CAN+TDWG-0230 cytochrome oxidase subunit 1(COI) gene, partial cds	650	1180	0.0	0	
(2).	B HQ078645.1	Demaptera sp. BOLD:AA05897 - Demaptera sp. BOLD:AA05897 voucher BIOUG-CAN-TDWG-0211 cytochome oxidaae subant 1(COI) gene, partial cds	659	1177	0.0	1	
(3).	HQ978642.1	Demosphera sp. BOLD:AAG9897 - Demosphera sp. BOLD:AAG9897 voucher BIOUG=CAN= TDWG-0298 sytochrome oxidase subunt 1(COI) gene, partial cds	659	1177	0.0	1	
(4).	□ КМ530435.1	Forficula all, auricularia A BOLD-2014 - Forficula cf. auricularia A JRD-2015 voucher BIOUG00571-H05 cytochrome ovidase suburit 1 (COI) gane, partial cds	659	1177	0.0	1	
45).	□ KM529678.1	Forficula alt, auricularia A BOLD-2014 - Forficula cf. auricularia A JRD 2015 voucher BLOUG00571-G10 cytochrome oxidase suburit 1 (COI) gene, partial cds	659	1177	0.0	1	

Our original question was: How does the type of food affect how beetles are attracted? We found that protein attracted the most amount of beetles. This means that more local beetle species are attracted to protein for food more than any other category. We got mixed results from the BLASTN, suggesting insects we did not collect. This is a mystery as to how it happened, somewhere during the process something got mixed up. We didn't expect to catch other insects in the process of collecting the beetles but some other groups of insects were caught. One mistake we made was not pouring in the cups correct amount of propylene glycol in our pitfall traps. We plan on continuing to investigate this question over