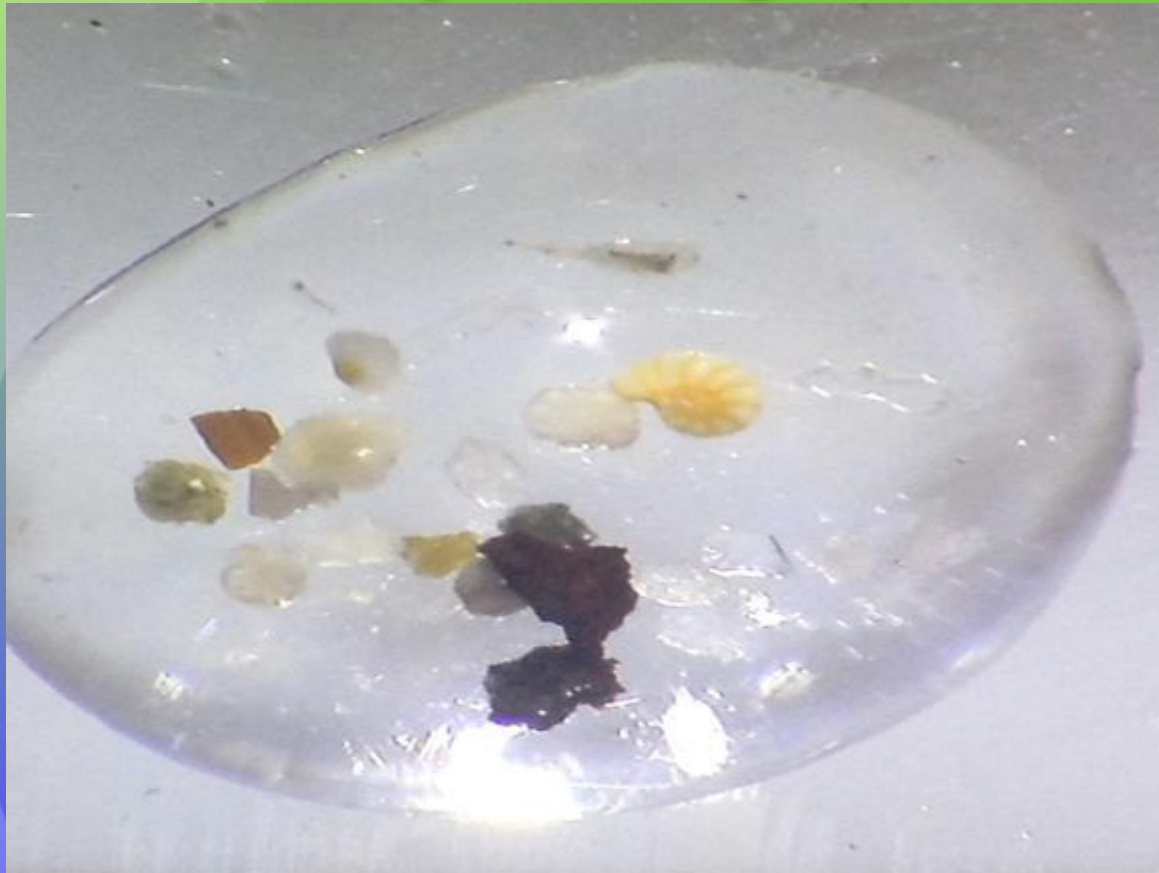


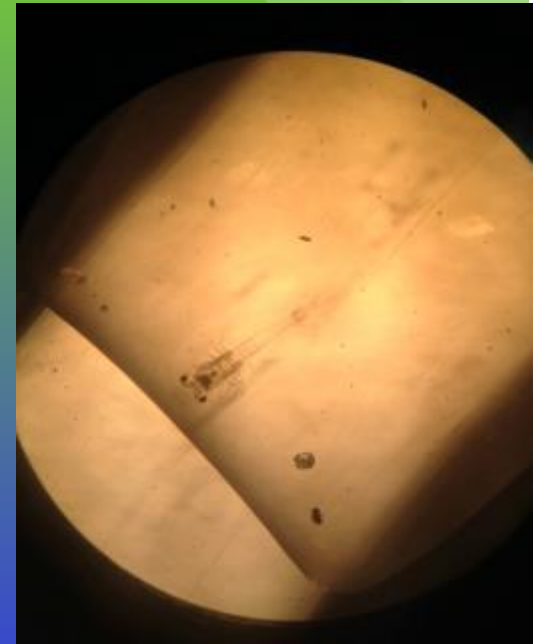
# Relative Abundance of Zooplankton: Day vs Night



Group: Karinne C., Britney H., Pasang S., & Megan K.

# General Knowledge

- Plankton-organisms that are free flowing or found in the water column, but are unable to swim against typical currents
- Holoplankton and Meroplankton
- A Diverse group of organisms (such as Cnidaria and Annelida and Arthropoda)
- “Diel vertical migration of zooplankton is a behavioral anti-predator defense that is shaped by the trade-off between higher predation risk in surface waters and reduce growth in deeper waters”(Loose 1994).
- Defense systems of plankton: some have spines, shells, setae, and spicules, transparency, and small body size.



# Introduction

- Question: Was there a difference in the amount of zooplankton at different times during the day?
- Hypothesis : There is a greater relative abundance of zooplankton at night than during the day
  - Null Hypothesis 1: There will be no difference in the relative abundance of zooplankton at night than during the day



# Materials & Methods



- Considine Beach on the NW side of North Keppel Island
- From beach threw net 3m off shore and pulled back in (x5) for each sample, then traveled east down the beach 10 m to conduct the next sample
- 3 samples taken in both Day (10:30am) and then again at Night (9:30pm)

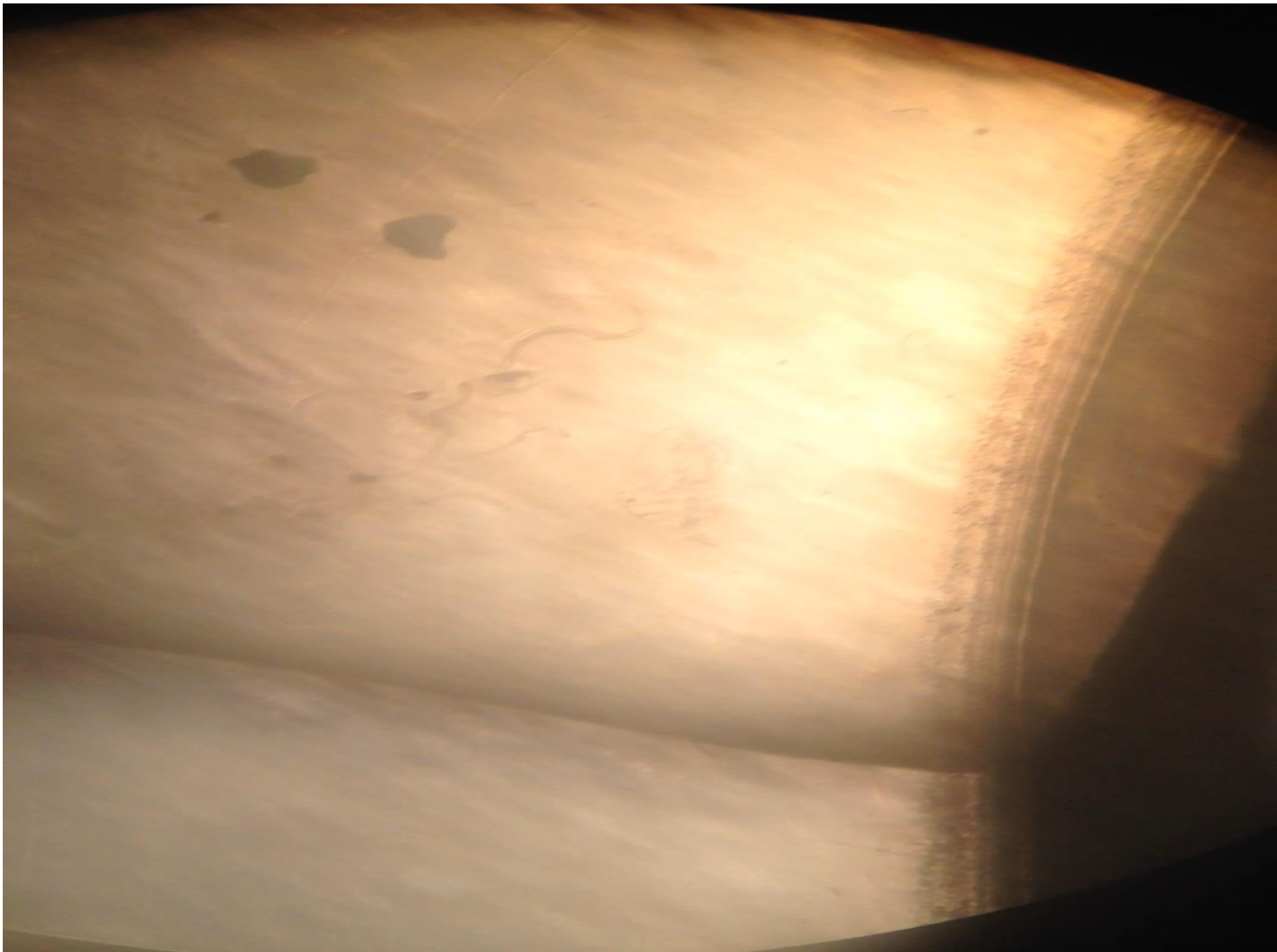


# Materials & Methods

- Identified zooplankton with microscope and plankton chart at North Keppel Island Education Center (NKIEEC)
- Added 1ml of Ethanol (70%) to aid in slowing down the movement of the zooplankton for ease of identification.
- Statistical tests:
  - 2 sample t-test
  - Simpsons Diversity index- one each for day and night  
$$D = \sum (n/N)^2$$







# Results

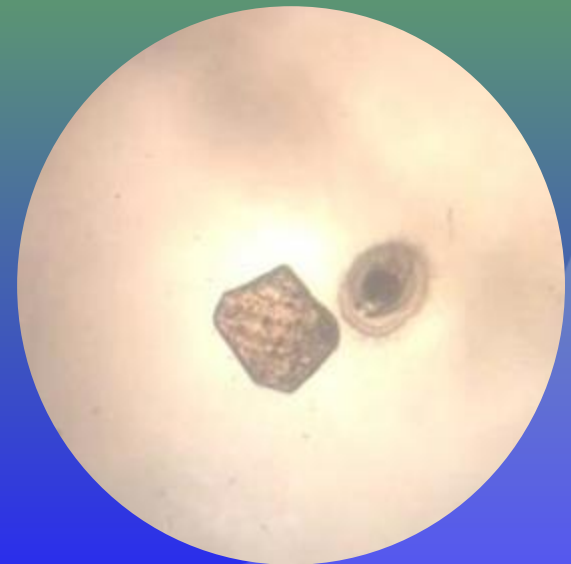
- T-test: Day vs Night p-value=0.038, which IS significant
- Simpson index for biodiversity- one each for day and night

$$D = \sum (n/N)^2$$

Found for Day: D value= 0.689

Night: D value=0.487

The bigger the value of D equals the lower diversity

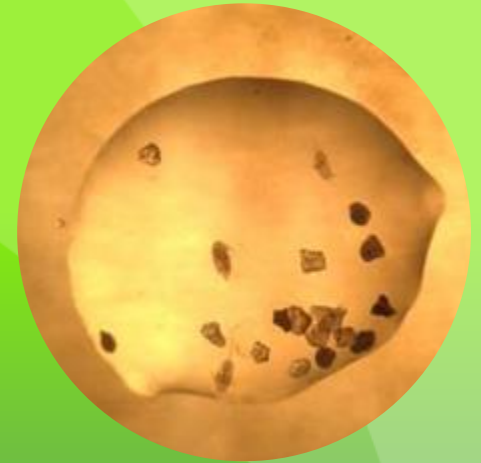


# Results

			Day	Night
Arthropoda	Copepod	Calanoid	247	203
		Cyclopoid	31	45
		Harpacticoid	2	8
		Nauplii	6	7
		Monstrilloid		1
	Cladoceran		1	2
	Decapod	Hermit crab larvae	1	
		Crab larvae		1
		Pistol Shrimp larvae		22
	Coelenterata		1	
	Euphausiids	adult	1	
	Amphipods	Hyperia	1	
	Mysid Schrimp			7
	Mollusca		Bivalve larvae	1
Annelida			1	2
Chordata				1
	Unknown		7	1
			300	300



# Discussion

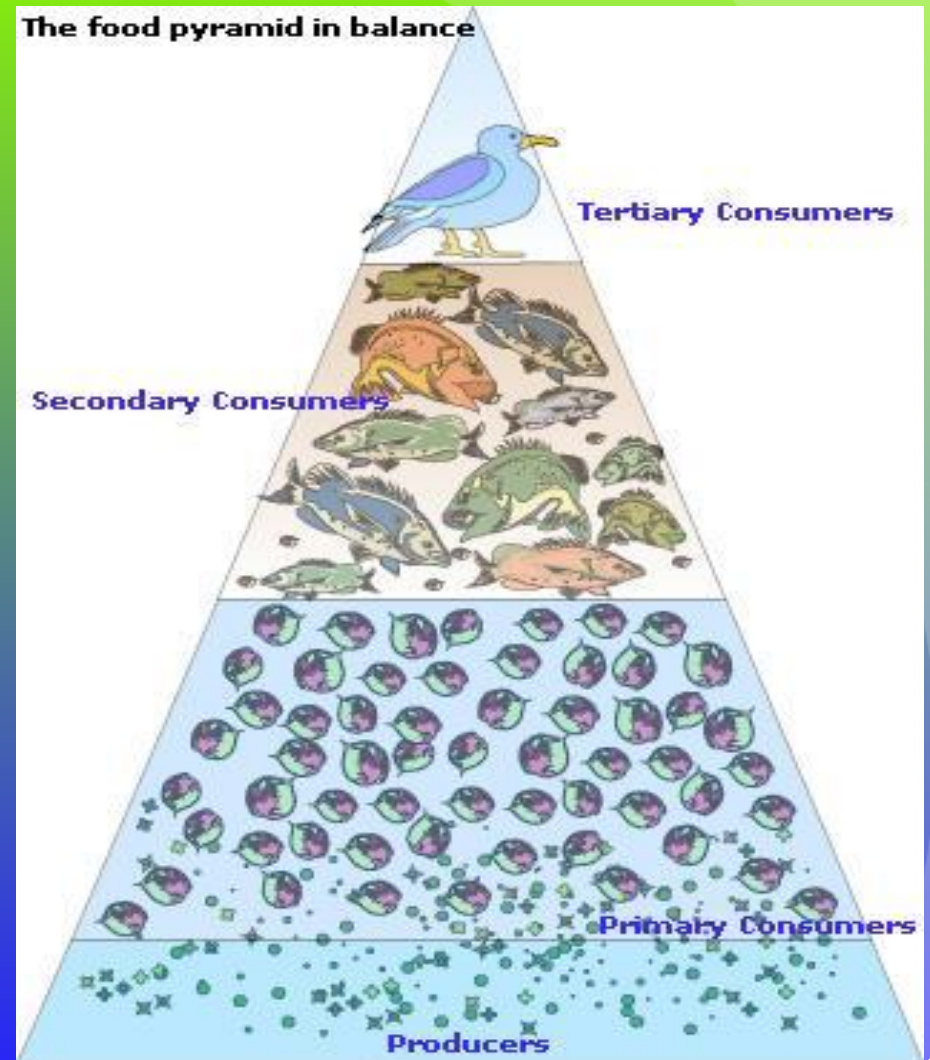


- Hypothesis 1: There is a greater diversity of zooplankton at night than during the day
- Null Hypothesis 1: There will be no difference in the diversity of zooplankton at different times during the day

**We Reject our Null Hypothesis**

# Discussion

- The Importance of Zooplankton:
  - Key components of marine ecosystems forming the basis of most marine food webs
    - They are known as primary producers
    - Larger animals depend on plankton as a food source



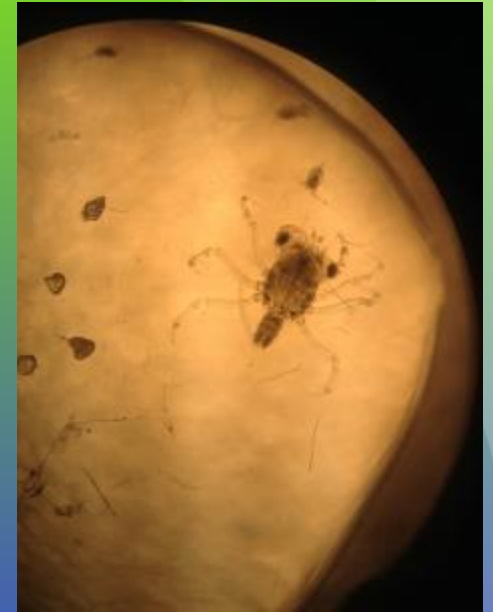
# Discussion

- Night Abundance:
  - More active
  - Migrate more in low light
  - Avoid predation
  - Save energy through metabolism by feeding in cold waters



# How To Improve

- More data (more samples)
- Repeated trials over multiple days
- More foreknowledge on plankton identification
- Future study:
  - Repeat experiment in Winter vs Summer
  - Look at presence at larvae to back calculate when Meroplankton (pistol shrimp) reproduce



# Literature Cited

- Loose, C.J., P. Dawidowicz. Trade-offs in diel vertical migration by zooplankton: the costs of predator avoidance. 1994. Ecology 75:2255-2263
- Roman, M.R., K.A. Ashton, A.L. Gauzens. Day/night differences in the grazing impact of marine copepods. 1988. Hydrobiologia. 167-168(1): 21-30.
- Plankton identification chart, NKIEEC
- Stephen Tettelbach's plankton lecture

