

Rat Lungworm Report

Kanu o ka 'Āina Senior Class 2016

- **Abstract:**

- Rat lungworm is a serious problem here in Hawai'i. The authors of the studies had collected data from September 2015 to January 2016. The purpose of doing this project is to exterminate the risk of rat lungworm at Kauhale 'Ōiwi o Pu'ukapu. The procedure of this project is to collect snails and put them in a gallon jar with a salt water mixture. It is important to use gloves or chopsticks to pick up snails. It is also very important to log all the data while collecting snails.

- **Purpose:**

- To become educated on the dangers of Rat Lungworm Disease to try and prevent any members of our school and community from getting sick.

- **Essential Question:**

- What is the extent of the snail population at Kauhale 'Ōiwi o Pu'ukapu, and do they pose a health risk to the students and faculty?

- **Hypothesis:**

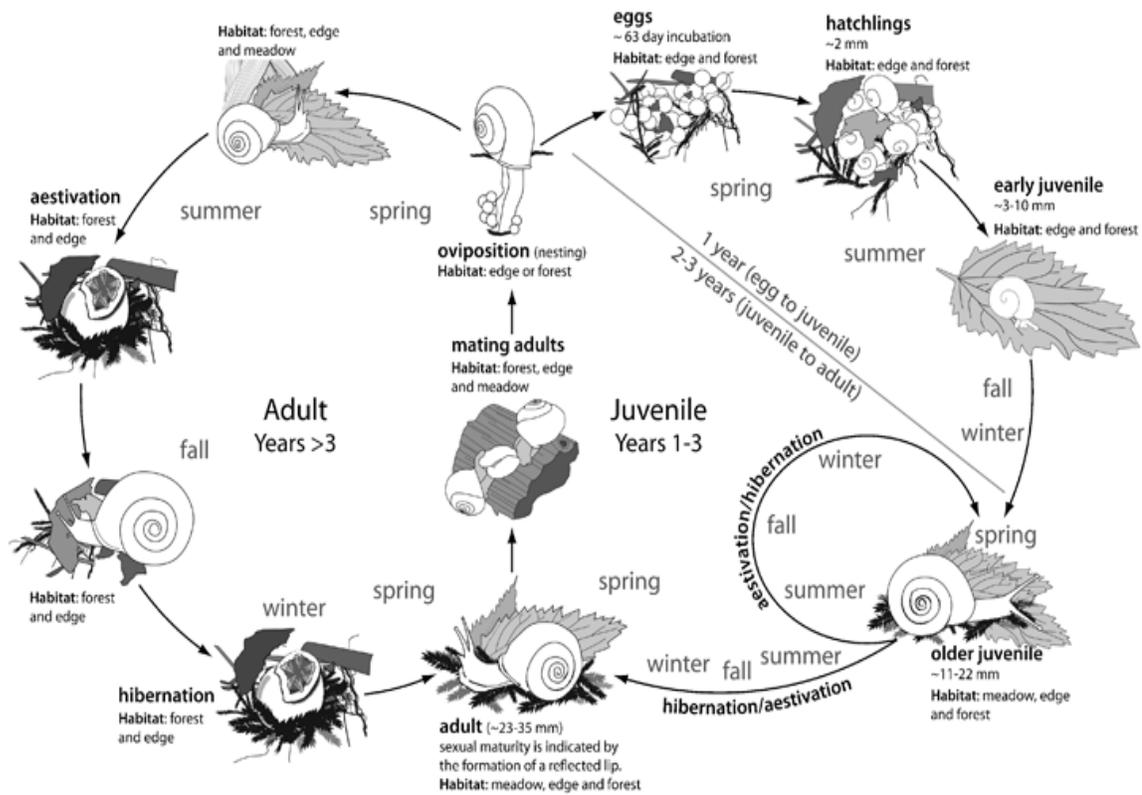
- If the snail population at Kauhale 'Ōiwi o Pu'ukapu is infected by the rat lungworm disease then the risk of someone catching the disease is very high.

- **Background Information:**

Angiostrongyliasis, also known as Rat Lungworm, is a disease that affects the spinal cord and the brain. It is caused by a roundworm parasite (parasitic nematode) called *Angiostrongylus cantonensis*. This parasite is only found in rodents, however, infected rodents pass the worm's larvae through their feces. Slugs, snails, and certain animals, including frogs, land crabs, and freshwater shrimp, can be infected by consuming the larvae. Such animals, are considered the intermediate hosts. Humans can also be infected with the disease if they ingest raw or undercooked products that bears the infection. The first documented case of RLWD internationally was in China in the 1940's. The first documented case in Polynesia was in the 1960's.

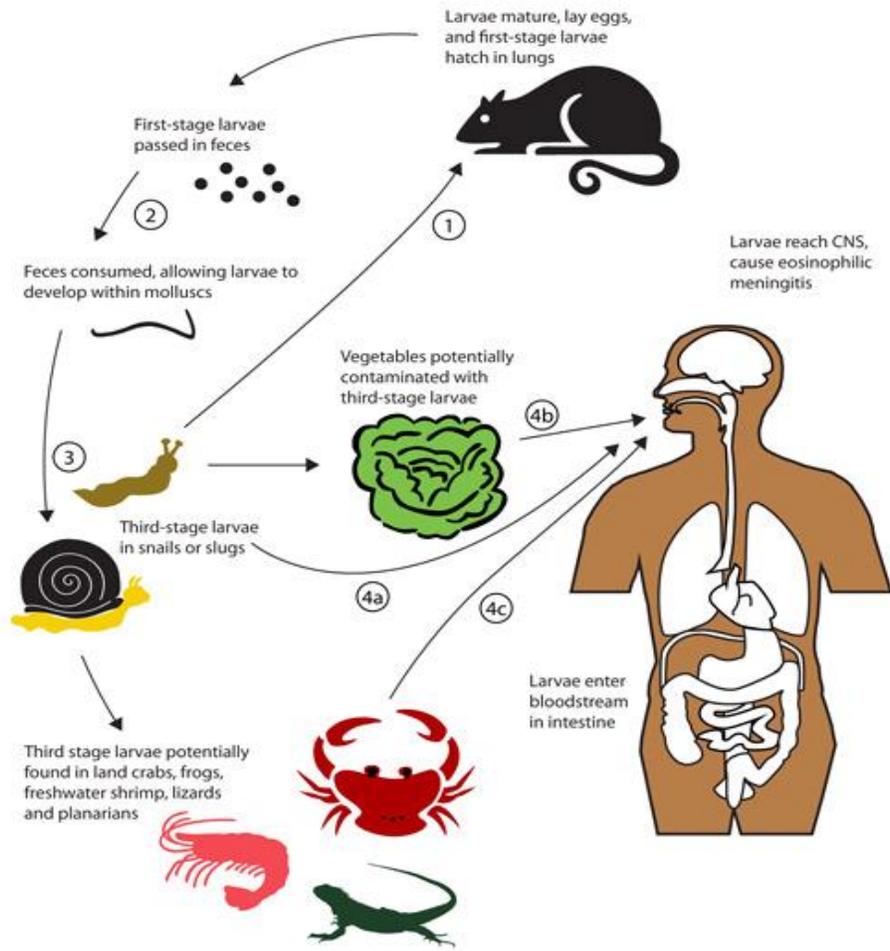
This infection can cause severe (and sometimes permanent) negative effects to the body. It can cause a rare type of meningitis (eosinophilic meningitis). Some infected people don't have any symptoms. Some may only experience mild symptoms and others may have severe symptoms. Symptoms can include severe headaches, stiffness of the neck, tingling or painful feelings in the skin, nausea and vomiting. Symptoms normally start 1 to 3 weeks after exposure, but can range from 1 day to 6 weeks because each case varies. Usually the symptoms last between 2-8 weeks and in some cases it has been reported to last longer.

- **Snail Life Cycle:** This diagram shows the life cycle of the average garden snail, the variety we are collecting.



http://bioweb.uwlax.edu/bio210/2011/allsop_dani/reproduction.ht

- **Cycle of Rat Lung disease:**



http://entnemdept.ufl.edu/creatures/nematode/rat_lungworm.htm

- **Materials:**

- “Slug Jug” One gallon size jar
- Water
- 1 1/8 cup of sea salt
- Tongs
- Chopsticks
- Latex gloves

- A notebook to keep data
- Pencil

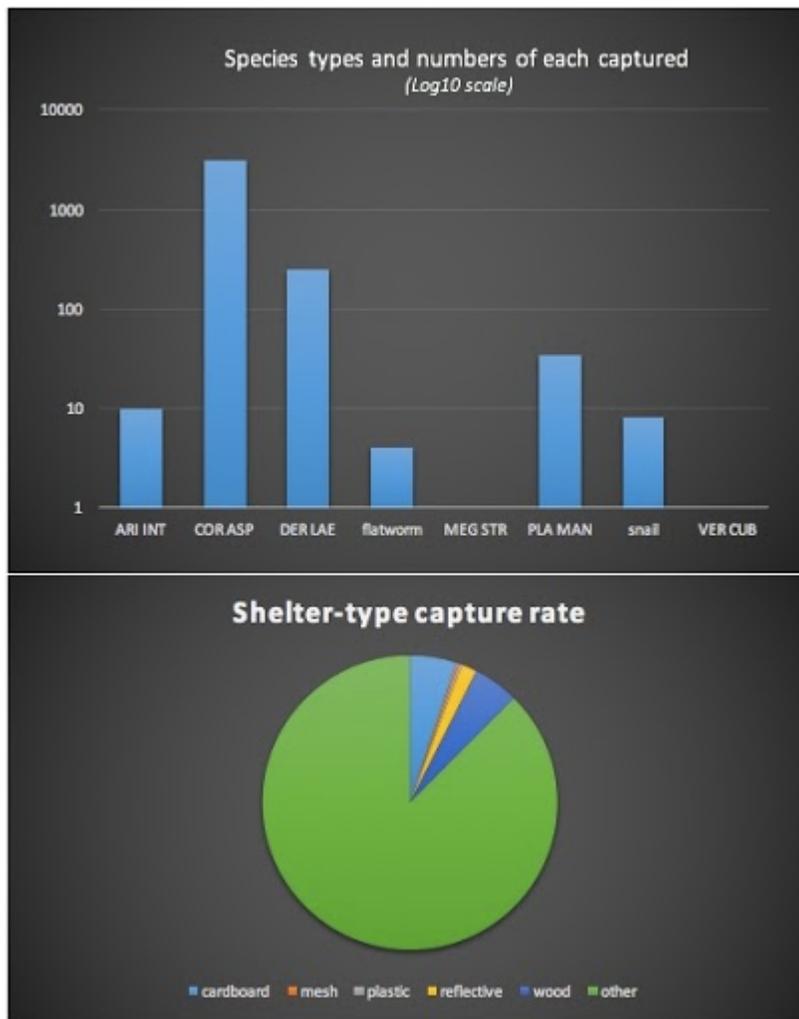
- **Procedures:**
 - Use any empty container for gathering snails.
 - Fill container halfway with water.
 - Add salt to container (1 1/8 cup of salt to 1/2 gallon of water.)
 - Gather snails and drop them in the slug jug (use gloves while gathering. Makes sure you cover the jug after every gathering session.)
 - Keep a tally of how many snails and slugs are collected.
 - Identify species of snails if possible.
 - Snails will die due to contact with salt.
 - Empty container in designated area (Caution: Saltwater solution will kill plants)
 - Repeat process once a week or as often as needed.
 - Later, compare your data that you have collected and see how effective your eradication was to see what you could do better or be more efficient.

- **Data Analysis/Results:**

Shelter type	Captured	Species	# Captured	Kanu Total Count	URL
Cardboard	176	ARI INT	10	3,145	https://docs.google.com/spreadsheets/d/1PZ0SpYim24sSVYPUAhPLsuxVQB5zfiGZIM179wzVE38/edit#gid=0
Mesh	10	COR ASP	3,106		
Plastic	11	DER LAE	251		
Reflective	57	Flatworm	4		
Wood	171	MEG STR	1		
Other	2,990	PLA MAN	34		
		Snail	8		
		VER CUB	1		

(22 snails tested out of 3,415)

Species	Number of snails collected	Number of snails with RLW
Deroceras laeve- Marsh laeve	6	0
Cornu aspersum- European garden slug	16	0
KANU campus	3,415	0



(Data graph from Kay Howe)

- **Conclusion:**

- In conclusion, based on the snail samples that were tested at the University of Hawai‘i at Hilo College of Pharmacy, the Rat Lungworm disease does not infect the snails at pu'ukapu. Out of the 3,415 samples collected, 22 of the Marsh laeve and European garden slugs tested negative for Rat Lungworm disease. The results show that the risk of catching this disease from Kauhale ‘Ōiwi o Pu‘ukapu very minimal. Although, due to a limited amount of samples tested, our data is inconclusive.

- **Bibliography:**

- Disease Outbreak Control Division. (n.d.). Retrieved April 05, 2016, from <http://health.hawaii.gov/docd/dib/disease/angiostrongyliasis/>
- Rat lungworm hawaii -<http://www.malamaopuna.org/ratlung/needtoknow.php>

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- **Follow up question(s):**
 - How long does the rat lungworm disease stay in the snails?
 - How long does the rat lungworm disease stay active?
 - What are the cure/treatment options for those diagnosed with rat lungworm?
 - What are the ways you can spot rat lungworm?
 - What are ways you can avoid getting rat lungworm?
 - Does eradication of asian garden snails from the campus influence the ecosystem?
 - Is rat lungworm transmitted another way besides through snails (blood, skin contact, etc.)
 - If Kanu’s campus is infected then what are some safety precautions we will need to take?

Snail Facts

- *Bradybaena similaris*: Asian tramp snail
- Family-Bradybaenidae
- Native Range -*Bradybaena similaris*: Southeast Asia *Fruticicola fruticum*: Central and Eastern Europe, and Asia
- **Located**
 - North America:
 - U.S.: southeastern U.S. including Alabama, Florida, Louisiana, Mississippi, Texas
 - Central and South America
 - Pacific Islands: Hawaiian Islands
 - Caribbean: Puerto Rico, Jamaica
 - Europe
 - Australia
 - Asia
 - Africa