

Searching For Nature Stories 2013

What place is the most suitable
for ants?

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Team 7 (Form 4)

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Abstract

In order to investigate what environment is the most suitable for ants to live in. We did two separate experiments. We assume that the suitability of that environment can be reflected from the walking speed of ants.

The first experiment is to find out whether dry, wet or greasy environment is the most suitable for ants. We observed the walking speed of the ants on different surfaces in different setups. We found out that ants walk the fastest in a dry environment. Therefore, a dry environment is the most suitable for ants.

The second experiment is to find out whether cold or warm temperature is the most suitable for ants. We also observed the walking speed of ants at room temperature and after putting them in a fridge for 10 minutes. Ants walk faster in room temperature than in low temperature. So, a warmer environment is more suitable for ants.

Introduction

Ants can be said to be the animals with the greatest population. Scientists estimate that there are one quadrillion (1,000,000,000,000,000) ants living on the earth at any given time. Even in Hong Kong, a very well developed urban city, ants still appear everywhere.

However, despite the large population of ants, very few people would stop and take a look at them. Most of the people just step on them without even noticing them. Our team is very curious about ants though. Especially on why there are so many ants in Hong Kong. So, we did an investigation on finding out the most suitable environment for them to live in by observing their walking speed in different setups.



a big group of ants

Objective

- 1) To understand the what environment is the most suitable for ants to live in
 - ~ Low or room temperature is more suitable for them
 - ~ Dry, wet or oily surface is more suitable for them
- 2) To know why ants are more suitable to live in these environment

Apparatus and Material

<u>Apparatus</u>	<u>Material</u>
a plastic bottle (for storing ants)	A4 Paper
Ruler (for measuring the distance the ant walked)	Stone bench
Glass jar (storing ants)	10mL of water
Old Toothbrushes (for catching ants)	10mL of oil
Timing watch	
Thermometer	
Fridge	

water

oil

Glass jar

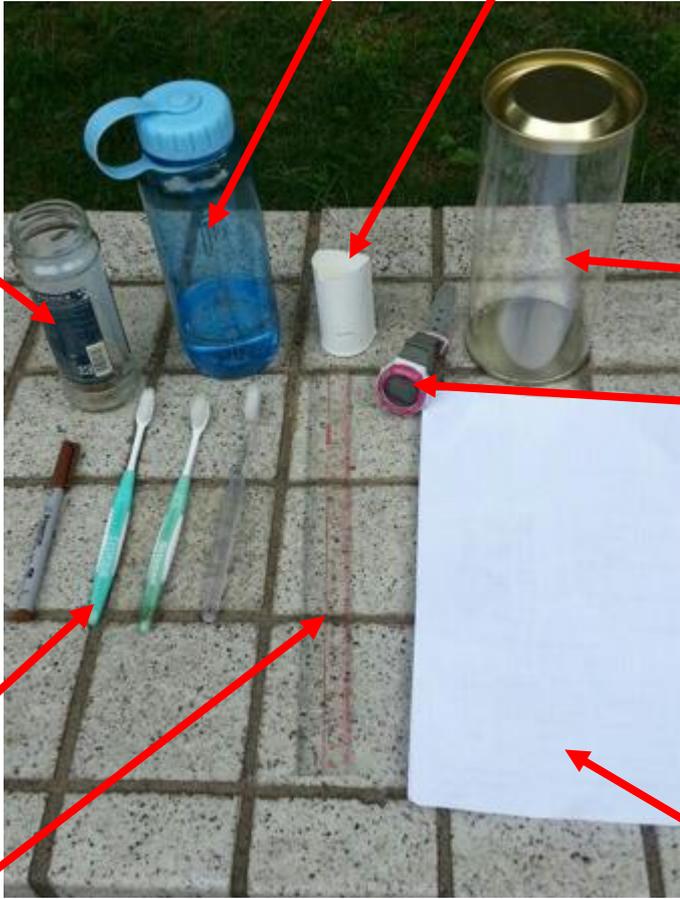
Plastic bottle

Timing Watch

Old toothbrush

A4 paper

Ruler



Time and Venue

We did the field investigation and the on two day, 10-4-2013 and 17-4-2013. We did the investigation in the playground of Lynwood Court, Kingswood Villas, Tin Shui Wai near block 7. Since our objective is not to investigate ants which are far away from human activity. So, ants in a playground is suitable for our investigation.



Playground in Lynwood Court

Procedures

Assumption: The walking speed of the ants equal to the suitability of the environment

1) Catching ants

Since we are catching ants in a playground, we don't want to use food as bait to catch the ants because it will make the public area dirty. So we trace trails of ants on the ground or on the tree trunk, then use a old toothbrush to sweep the ants into our bottle/jar



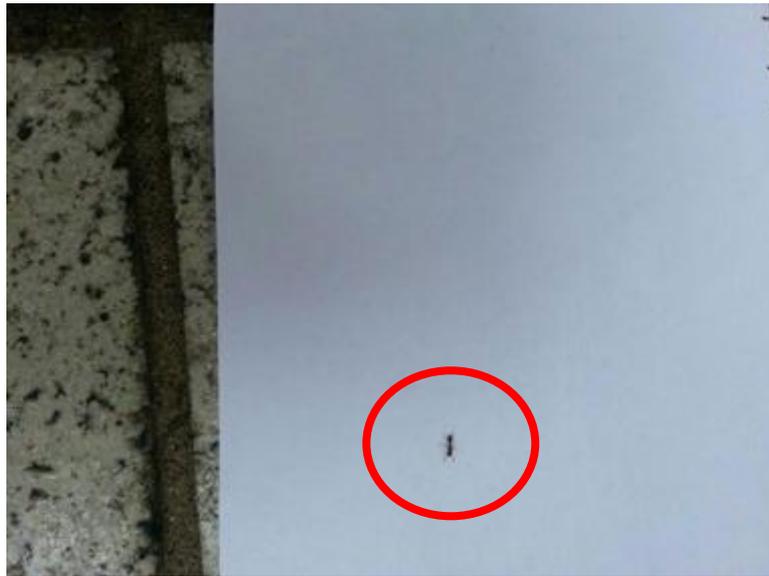
One of our teammate catching ants

In order to protect the environment we caught only 10 ants each time and store in inside a bottle/jar.

2) Experiment 1 (determining the greasy/wet/dry environment is more suitable)

We let 5 ants out and let them walk on stone bench, wet stone bench, greasy stone bench, paper and plastic bottle and we

observed the walking speed of the ants.



an ant walking on a paper

3) Experiment 2 (determine low/room temperature is more suitable for ants)

We put 5 ants on a plastic bottle at room temperature and observed and video taped their movement first. Then, put the whole bottle into the fridge for 10 minute. Take it out and observe, video tape their movement again. Compare the walking speed of the ants before and after putting into the fridge.



Ants inside the bottle before putting it into the fridge

Result and Information

- 1) Determining wet/dry/greasy environment is the most suitable for ants

According to the result of the experiment carried above, we have sum up a table:

The effect of different environment on ants' walking speed

(key: X=very slow, XX= slow, XXX=fast, XXXX=very fast)

Material used \ Ants	Stone beach	Glass bottle	Paper sheet	Water Surface	Oil surface
Ant A	XXX	XX	XXXX	XX	X
Ant B	XX	XXX	XXX	X	X
Ant C	XXXX	XXX	XXXX	X	X
Ant D	XXXX	XXX	XXXX	XX	X
Ant E	XXXX	XXXX	XXXX	X	X

2) Determining whether low temperature or room temperature is more suitable for ants

According to the result of the experiment carried above, we have sum up a table:

The effect of temperature difference on ants' walking speed

Temperature \ Ants	Room temperature(28.3° C)	Low temperature(17.6° C)
Ant A	Faster	Slower
Ant B	Faster	Slower
Ant C	Slower	Faster
Ant D	Faster	Slower
Ant E	Faster	Slower

The table above indicates that difference in material used and temperature result in difference in activity rate of ants.

From table A, most of the ants can walk faster on stone beach, glass bottle and paper sheet. Therefore, we can discover that ants is suitable to live in dry environment, instead of wet environment(i.e. water and oil).

From table B, most of the ants are inactive in low temperature. Therefore, we can realize that ants cannot withstand cold weather.

In conclusion, we have investigated the characteristics of the living environment of ants. They would choose relatively warm and dry places as their home.

Discussion

After the investigation, we found out that dry and warm environment is more suitable for ants to live in. However, why do they choose this kind of environment? We will discuss it below.

1) Why do ants choose to live in warm environment

Ants are cold-blooded just like all other insects and some other animals, like reptiles. This means that when an ant is in someplace cold, its body gets cold very quickly. It is harder for ants to move around when they are cold. So, they will choose to live in some relatively warm environment.

2) Why do ants choose to live in dry environment

Ants breathe through spiracles in their abdomen. They can close off the spiracles to keep the water out and can remain in water for a while. However, since they can breathe in water, they can't live in an environment which is too wet.

References

- 1). <http://en.wikipedia.org/wiki/Ant>
- 2) <http://library.taiwanschoolnet.org/cyberfair2006/gard1234/now1/now14~18/now15.htm>
- 3) <http://hk.knowledge.yahoo.com/question/question?qid=7007121203931>
- 4) http://wiki.answers.com/Q/Can_ants_live_under_water
- 5) <http://www.hometrainingtools.com/ants/a/1415/>

Reflection

Sin Cheuk Lam:

Before joining this competition, I never would have thought that ant is such an interesting animal. After I have joined this competition, I was encouraged to observe more things around me, it also lit up my interest towards biology. I also learn a lot of skills about doing field investigation in this competition.

Chau Yi Ching Almos:

Little ant, we often ignore them, because it is too small, too humble..... However, we can find out the highlights of the ant's body, and what things we should learn from it? First I can learn good team spirit. Second I can learn that the ants never give up. If they run to a place, and you want to try to stop them, they will look for another route, until they find another route. Never give up, and have been looking for a route toward the place you want to go.

Yiu On YI:

I think this is an very good opportunity. I have never look at ants very detailly, I have always ignore them or just step on them. This project provides an opportunity for me to understand ants more. I have learnt the structure and the most suitable environment for ants. Different species have different characteristics. If we learn more, we will find more fun in them.

Sun Nim Ching:

I think this project is very meaningful and informative. Though investigating the most suitable environment of ants, I have observed ants very carefully and learnt much knowledge about them. In the past, I simply ignored this common organism in my daily life. However, this project stimulated my curiosity on the living species surrounding us. So I will pay more attention to them in the future.