

The effect of water flow rate on the diversity of animal species

Group6
CHAN PUI LAM

Independent variable: water flow rate

Measuring the water flow rate



1. The sensor of current meter was dipped into the surface, middle and bottom of the depth of river water respectively.
2. The reading of the current meter was taken when it was steady.
3. The reading on the meter was measured.
4. An average value of the readings was taken.
5. Step 1 to 4 were repeated at different places.

Dependent variable: species diversity

Method of measure: animal sampling

1. A quadrat was placed on the rocky surface with different water flow rate
1. A photograph was taken
2. Different species were counted and identified in the quadrat by sight
1. The organisms stuck on rock were swept into the tray
2. The organisms under the rock were counted and identified.



Controlled variables

1. Light intensity
2. Water temperature
3. Depth of water



Assumptions

1. The abiotic factors (pH value, concentration of dissolved oxygen concentration...) at different places with different water flow rate were the same as they were connected and nearby.
2. 30 minutes investigations at each area were representative enough for counting the population of animals species.

Controlled variables

Flow rate	Light intensity / Lux	Temperature / °C	Depth of water / cm
0 m/s	14010	25.0	10
0.223 m/s	12500	24.5	10
0.357 m/s	13500	24.6	10

Results

	0 m/s	0.223 m/s	0.387 m/s
Mayfly Nymph	2	0	3
Water Skater	0	0	2
Damselfly Nymph	0	1	0
Stonefly Nymph	1	2	2
Large Stream Snail	5	3	1
Viviparid Snail	2	0	1
Pond Snail	1	0	0
Bee Shrimp	1	0	1
Sucker belly Loach	1	0	0
Simpson's Diversity Index	0.154	0.267	0.111

Discussion



It was found that the numbers of different species at different places were generally small. It could be attributed to:

- the heavy rain occurred recently decreased the numbers of different species per unit volume
- some places we investigated used to have little animals



Discussion

Simpson's Diversity Index at place with moderate water flow rate was the highest.

It might due to:

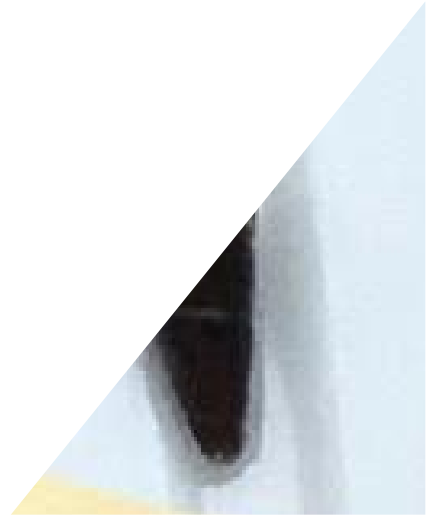
- most of the animals in the stream were able to tolerate moderate water flow rate
- So the place with moderate water flow rate had the highest degree of species evenness

Simpson's Diversity Indices at places with slow and fast water flow rate were similar.

It might because only part of the animals were able to tolerate moderate water flow rate.

Discussion: Large stream snail

- They were more likely to be found in slow water flow rate region
- The higher the water flow rate ,the fewer they could be found
- They are suitable to live in the region with slow water flow rate because they can stick on the rock firmly



Discussion: sucker belly loach

- Could form a sucker-like adhesive disc
- Could suck in the small rocks between lake.
- Were more likely to be found in a slow water flow region.



Conclusion

1. The species evenness was the highest at place with moderate water flow rate
 - The Simpson's diversity index was the highest at place with moderate water flow rate
 - Extreme water flow rate affects the living of most of the animals
2. The species abundance was the highest at place with still water
3. large stream snail is more adaptive to live at low water flow rate
 - There are more large stream snail found at low water flow rate

Thank you

