BUG'S LIFE 4-003

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Hwa Chong Institution
Category 4 Resource Development

Project Work 2020
Category 4: Resource Development

Contents

Abstract
Our project is to create a website to raise awareness on the species of bugs in Singapore, their population decline and their threats.

1. Introduction

1.1 Rationale

Insects play a significant role in our ecosystems, but they are declining at an alarming rate. Yet there is little awareness of the diversity and roles of these insects.

1.2 Objectives

- To raise awareness about the declining population of insects
- To help people gain a better understanding about the variety and types of insect species in Singapore and allow for greater interest in them

1.3 Target Audience

The general public that does not know much about insects

2. Review of Existing Resources

Informal Macro Outing Group. (n.d.). Retrieved from https://natureimog.wordpress.com/

National Parks Board. (2015). SGBioAtlas (2.0.6) [Mobile application software]/ Retrieved https://play.google.com/store/apps/details?id=sg.gov.nparks.BiodiversityApp

The Biodiversity of Singapore. (n.d.). Retrieved August 07, 2020, from https://singapore.biodiversity.online/species/

Kok, R. D. (2019). Https://www.nparks.gov.sg/sbg/research/publications/gardens-bulletin-singapore/-/media/sbg/gardens-bulletin/gbs_71_01_y2019v71_01/71_01_06_y2019_v71p1_gbs_pg87.pdf.

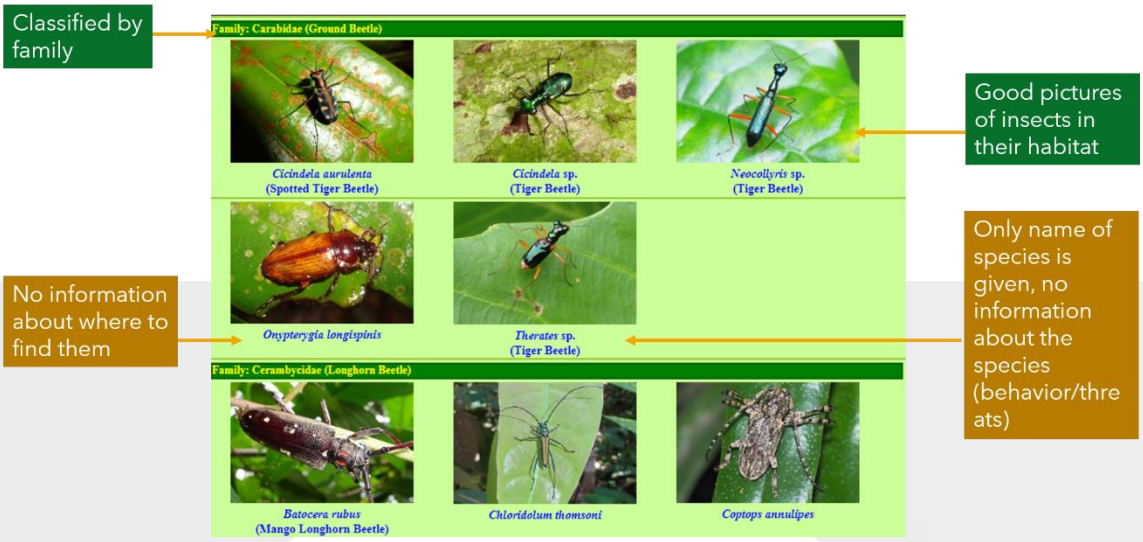
Gardens' Bulletin Singapore, 71(1), 89-139. doi:10.26492/gbs71(1).2019-07

Home.(2020, July 20). Retrieved August 07, 2020, from https://lkcnhm.nus.edu.sg/

On a scale of 1 to 10 (1 being the least)	Beetles@ sg	NickyBay	Singapore Biodiversity	Natureimog	Sgwild animals	LKCNHM resources	SGBio Atlas	Nparks papers
Photos	5	9	7	6	6	5	8	7
Navigation	5	6	9	6	6	6	9	8
Description	6	6	5	4	1	8	7	9

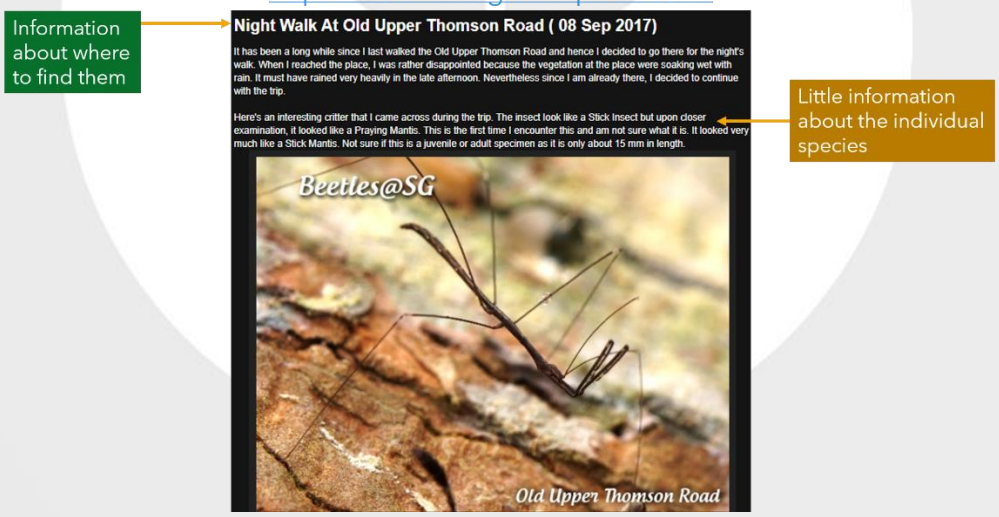
Although all the resources have photos of insects for the public to learn more about them, most do not classify the insects by order and people are not able to find the species they are looking for. They may not even know the name of the insect they have found and cannot learn more about it.

https://natureimog.wordpress.com/

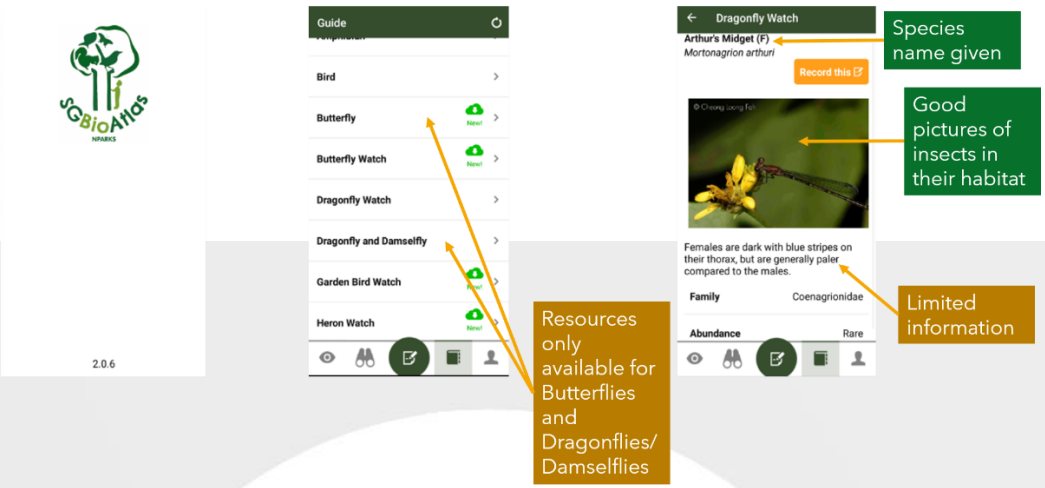


This website provides good pictures of insects classified by order in their habitats. However many of the insects in the pictures are not identified and not much information about the species can be found. The public would not be able to learn more about the insects and appreciate them.

https://natureimog.wordpress.com/



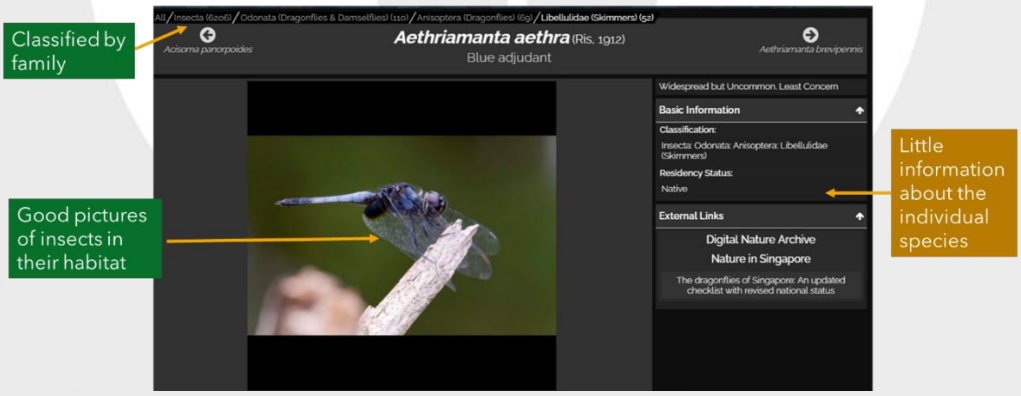
This website provides good pictures of insects in their habitat but insects are not classified by order causing people to have a hard time navigating the website. Not much information about the insect is given, and people are unable to learn about them.



This app provides good pictures of insects classifed by order in their habitat. It provides a brief description about the insect.

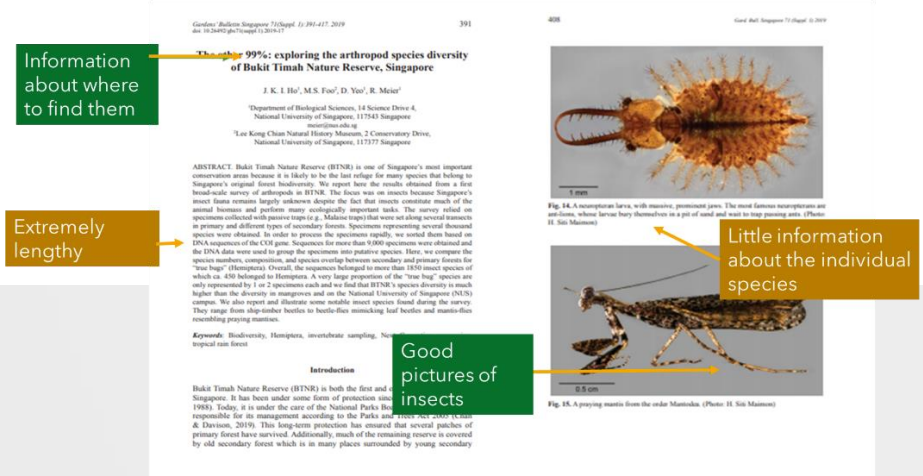
However, there is not much information about its behaviour. Resources are only limited to Dragonflies and Damselflies and Butterflies.

https://singapore.biodiversity.online/species/



This website provides good pictures of insects classified by order in their habitat but there is no description about the insect.The public is unable to learn more about them.

Nparks Research Papers



Although this paper provides a lot of information about the insects, it is very hard to understand. There is also little pictures of insects in their habitat. The public may find it difficult to learn more about them.

3. Methodology

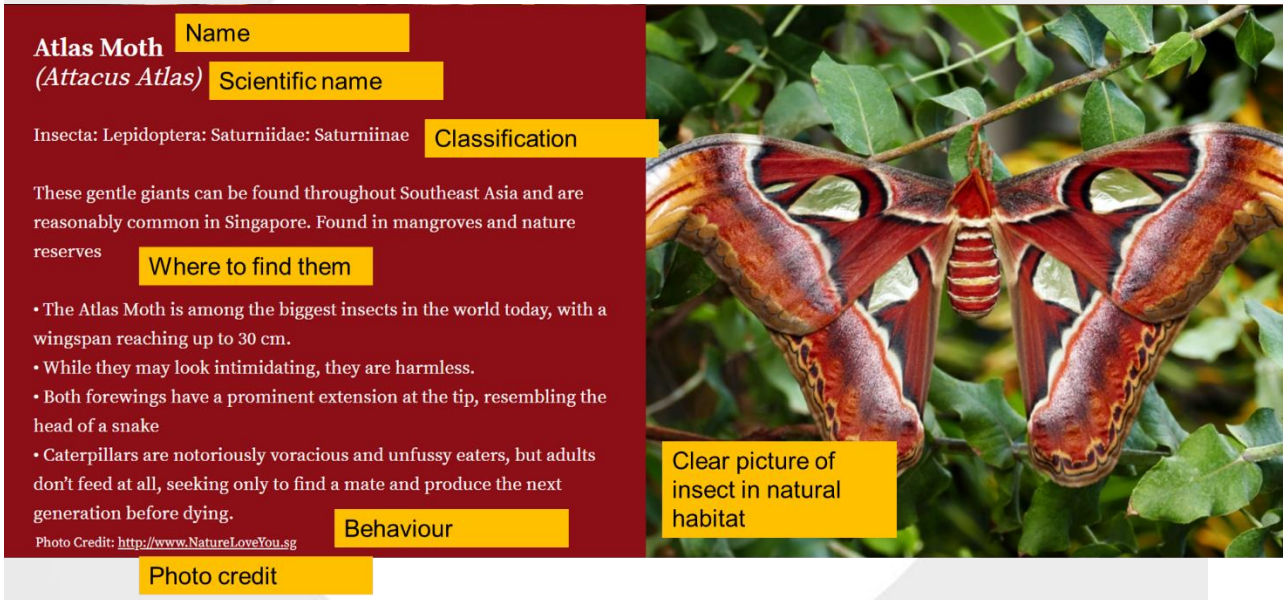
Website:https://tinyurl.com/project-bugs-life

Our website has extensive information about 50 insect species classified by order, with pictures of them in their habitat.

Homepage – Our Purpose

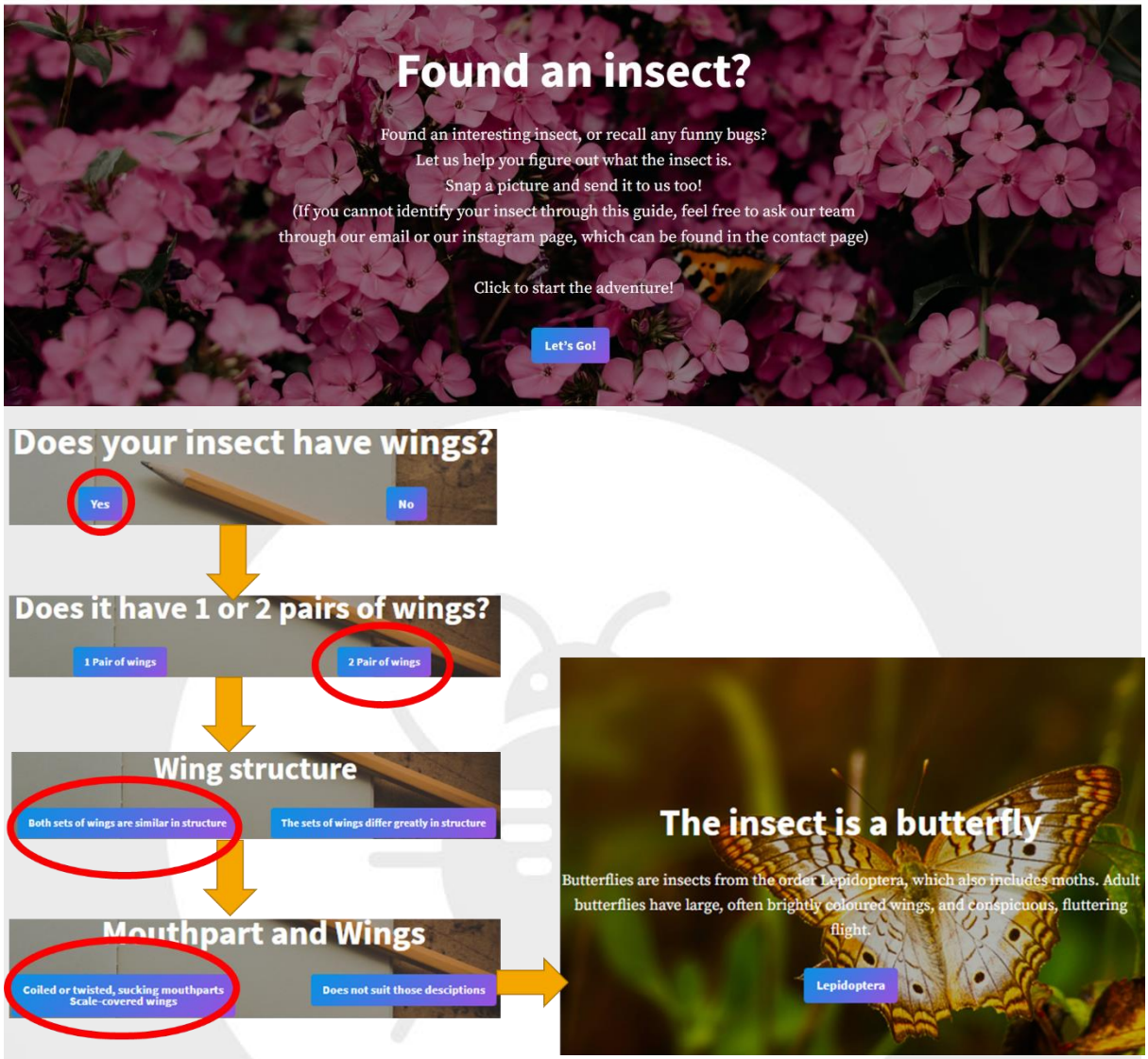
Raising Awareness about Decline

Lepidoptera – Butterflies and Moths



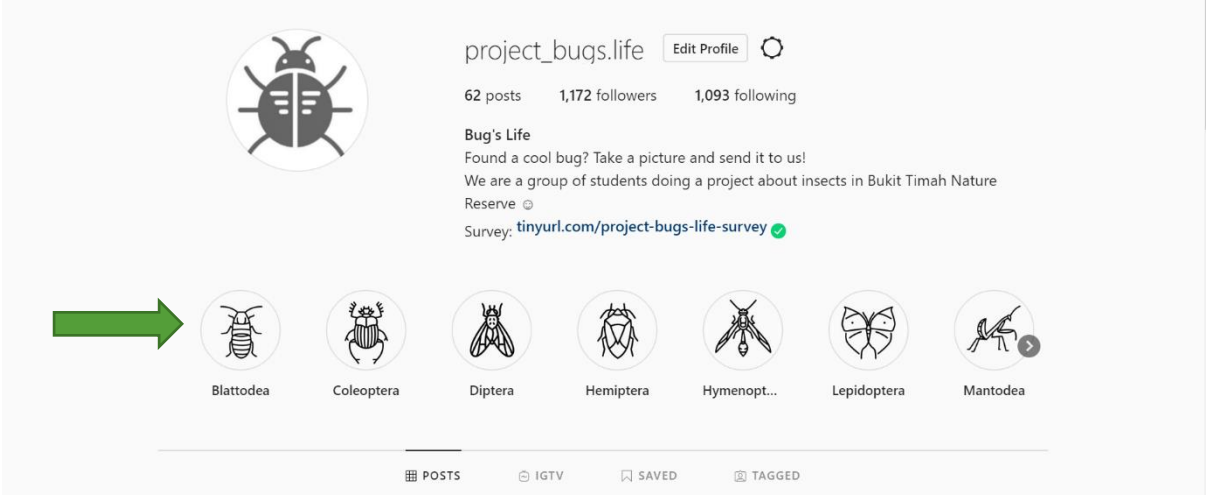
Atlas Moth, an example of an insect on our website

What bug is this?



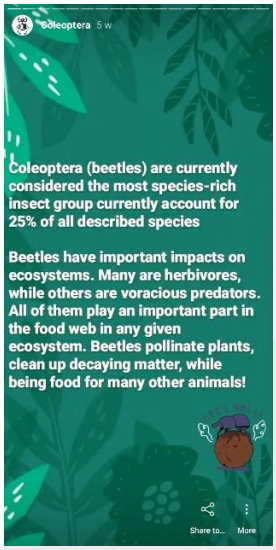
Bug Finder-where people can use the appearance of the bug to identify it to learn more about it.

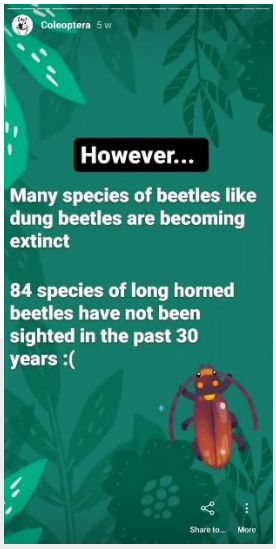
Instagram: project_bugs.life https://www.instagram.com/project_bugs.life/



Information about each insect order can be found on our Instagram page. Tap on the bug icon (arrow) you are interested to know more about and you can view it!

Instagram – Insect orders



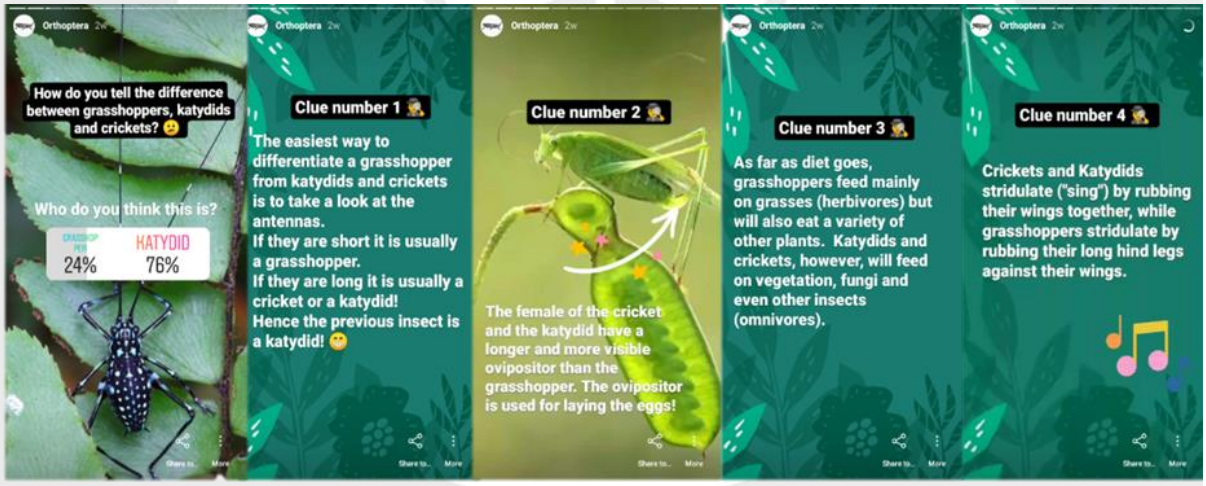


Information on beetles

Fun Facts

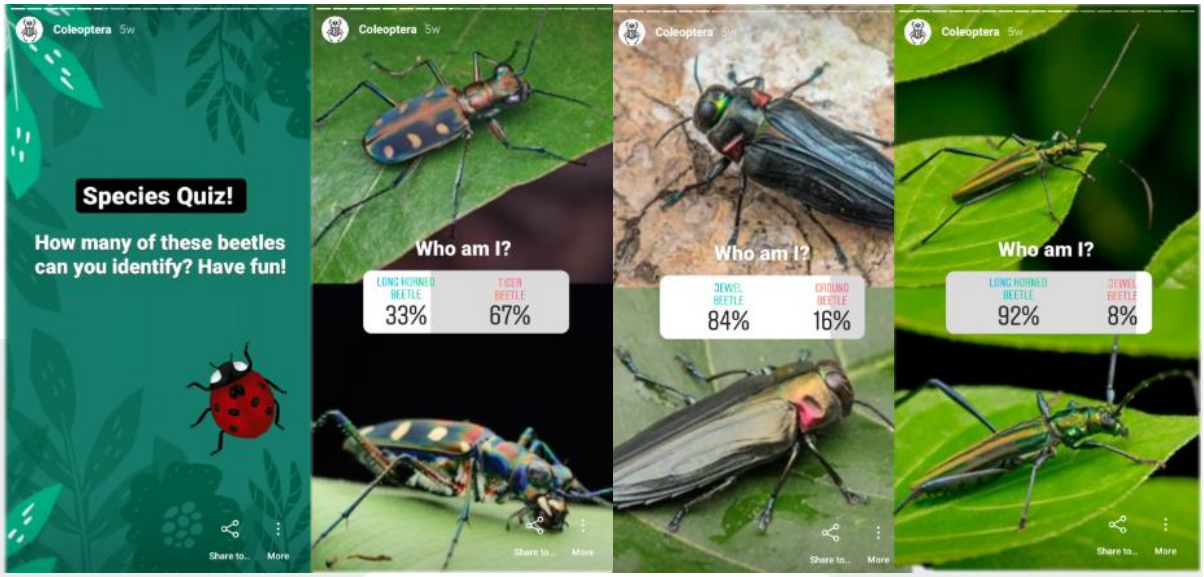
Decline

Instagram – Information about the order



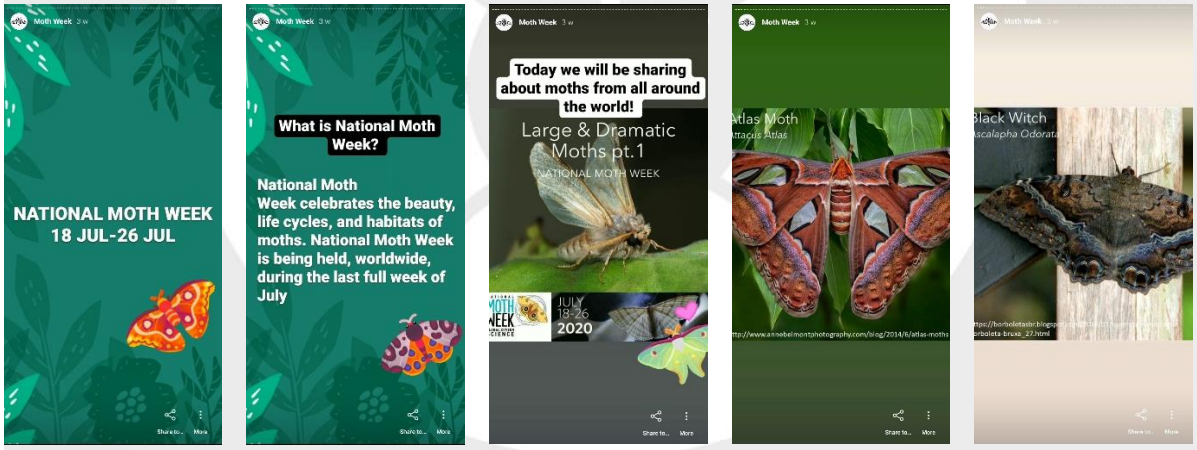
How to identify the insect

Instagram – Information about the order

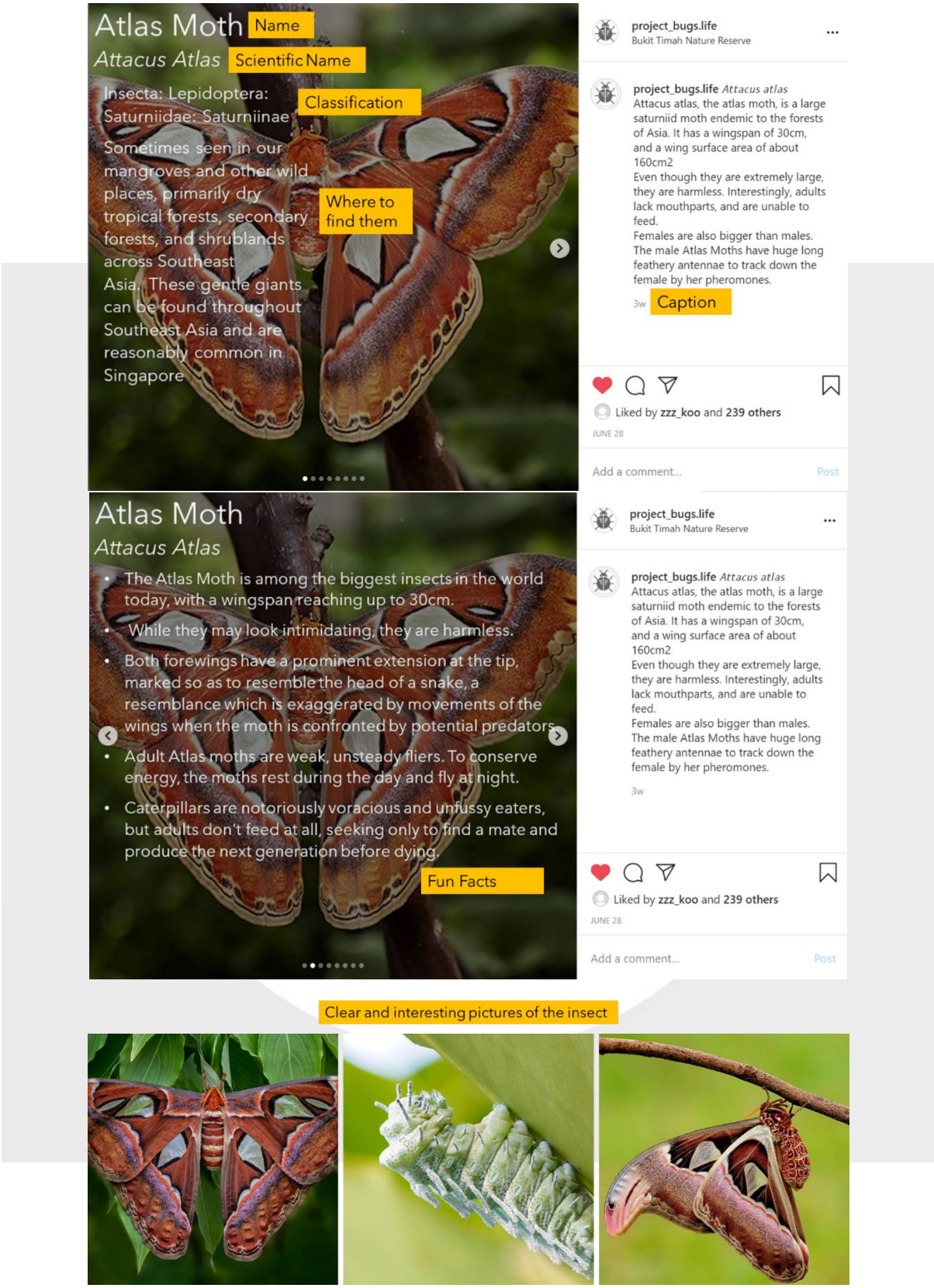


Quizes on insect

Instagram – Quizes on insects



Instagram- National Moth Day and Raising awareness about diversity of moths

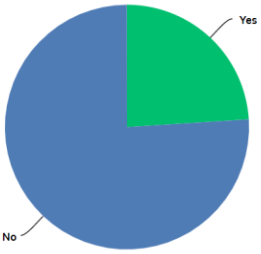


Instagram – Example of our post

3.1 Needs Analysis

Do you know that the population of bugs are declining?

Answered: 50 Skipped: 0

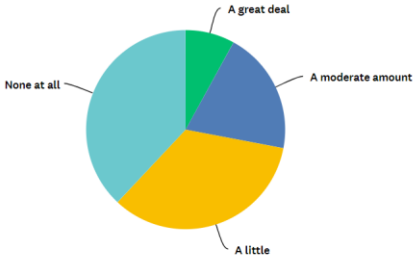


ANSWER CHOICES	RESPONSES	
Yes	24.00%	12
No	76.00%	38
TOTAL		50

Most people are oblivious about the insect population decline.

How much do you know about bugs?

Answered: 50 Skipped: 0

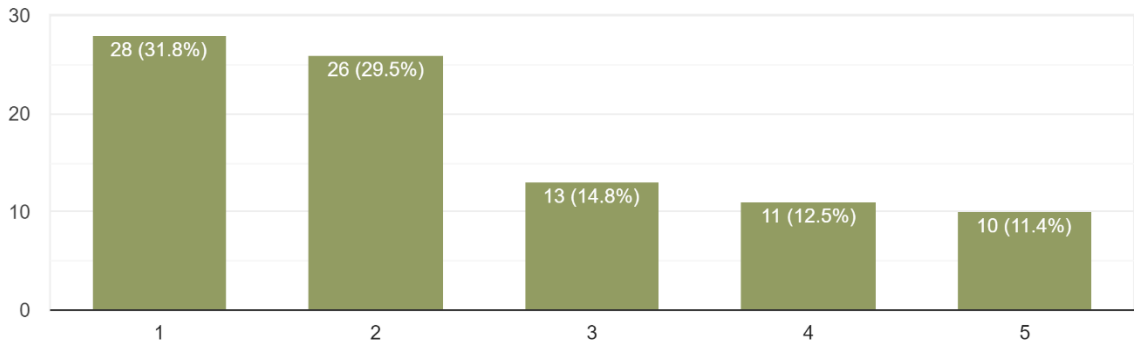


ANSWER CHOICES	RESPONSES	
A great deal	8.00%	4
A moderate amount	20.00%	10
A little	34.00%	17
None at all	38.00%	19
TOTAL		50

The majority of the people do not know much about insects.

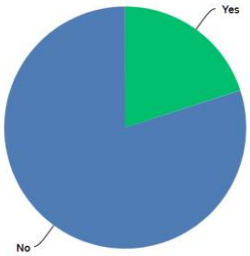
How much did you understand about insects?

88 responses



Do you know any websites that provide information about bugs in Singapore'

Answered: 50 Skipped: 0

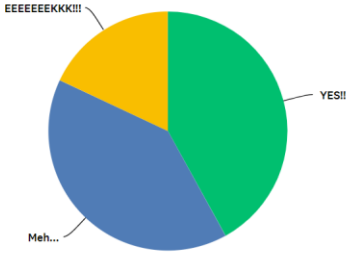


ANSWER CHOICES	RESPONSES	
Yes	20.00%	10
No	80.00%	40
TOTAL		50

Many are unable to find resources to learn more about insects.

Do you like bugs?

Answered: 50 Skipped: 0

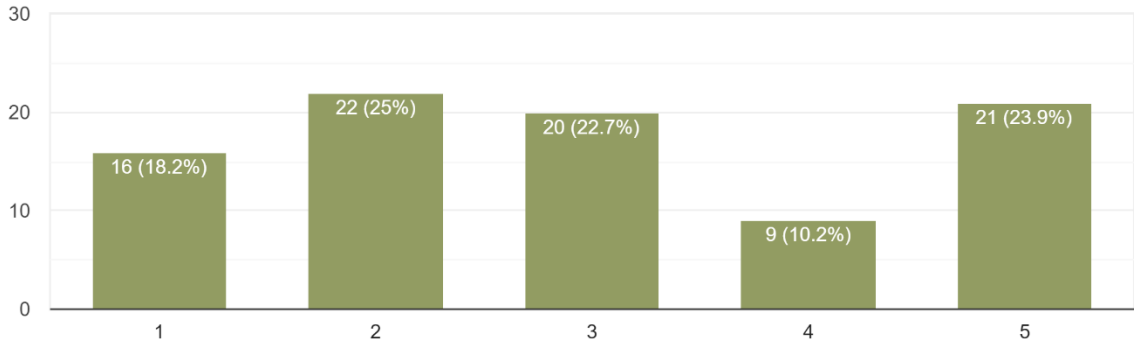


ANSWER CHOICES	RESPONSES	
YES!!	42.00%	21
Meh...	40.00%	20
EEEEEEEKKK!!!	18.00%	9
TOTAL		50

58% of the respondents did not like bugs that much before seeing our resource possibly due to lack of understanding of these insects.

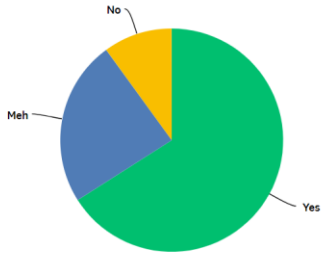
How much did you like insects?

88 responses



Would you like to know more about bugs and where to find them?

Answered: 50 Skipped: 0

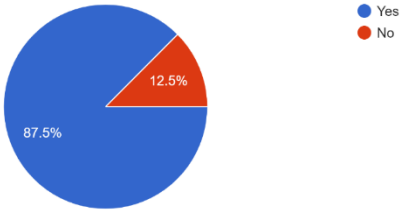


ANSWER CHOICES	RESPONSES	
Yes	66.00%	33
Meh	24.00%	12
No	10.00%	5
TOTAL		50

Although many do not like insects, 66% of the respondents were willing to learn more about these insects and where to find them.

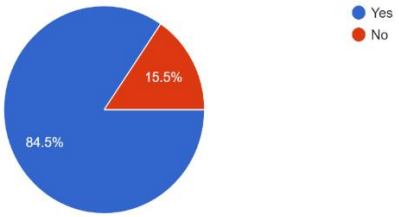
Have you been to Bukit Timah Nature Reserve or any other nature reserve?

88 responses



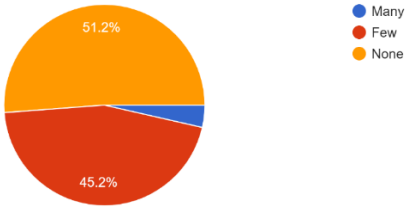
Have you spotted any insects there?

84 responses



Were there signs or boards about insects in the reserve?

84 responses



Many people go to reserves. However, they said they were unable to identify the insects. There were also few or no signs at the reserve with information about the insects. The public is unable to find resources to learn more about insects.

3.2 Secondary Research

We have referred to many reliable websites for our secondary data, such as, https://beetlesg.blogspot.com/, https://singapore.biodiversity.online/ and Lee Kong Chian Natural History Museum Resources along with research papers like those from Nparks.

3.3 Construction of Resources

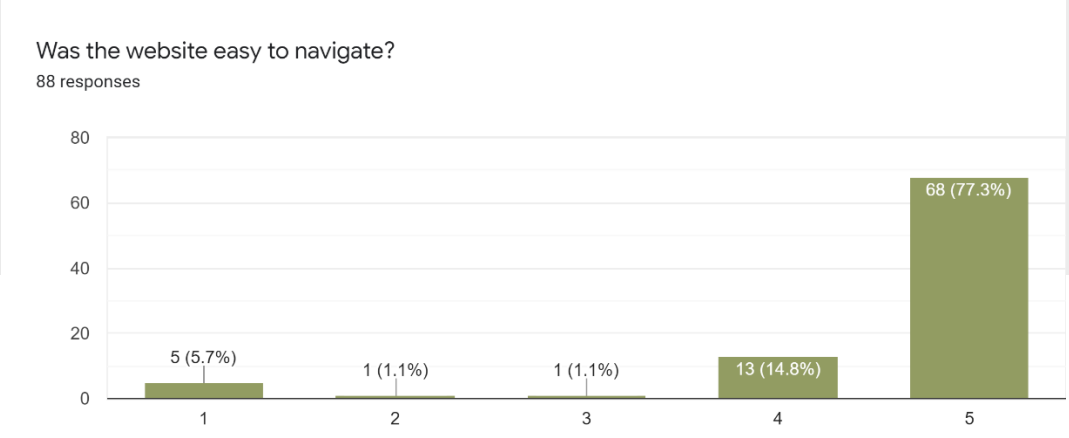
We used wordpress to construct our website.

We have also created an instagram page, and posted information on the insects along with clear pictures. We have quizzes and information about each insect order.

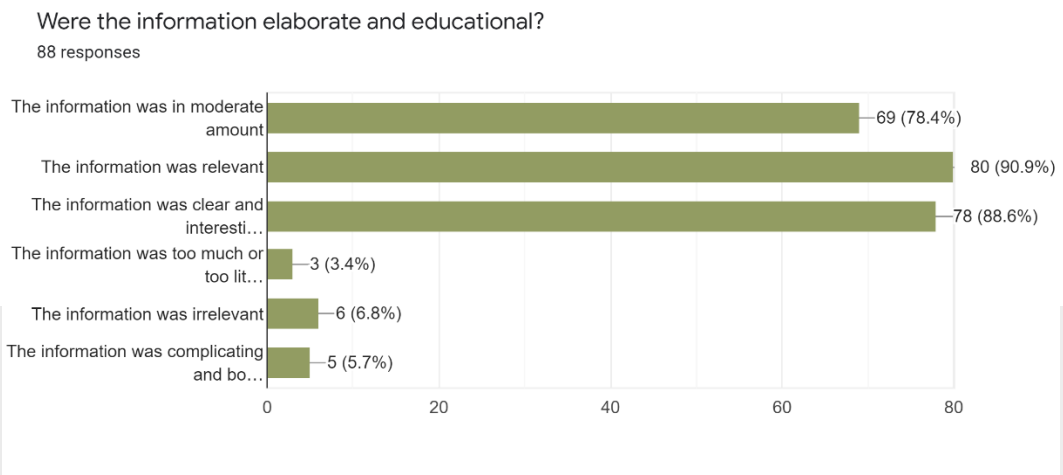
3.4 Pilot Test & Expert Opinion

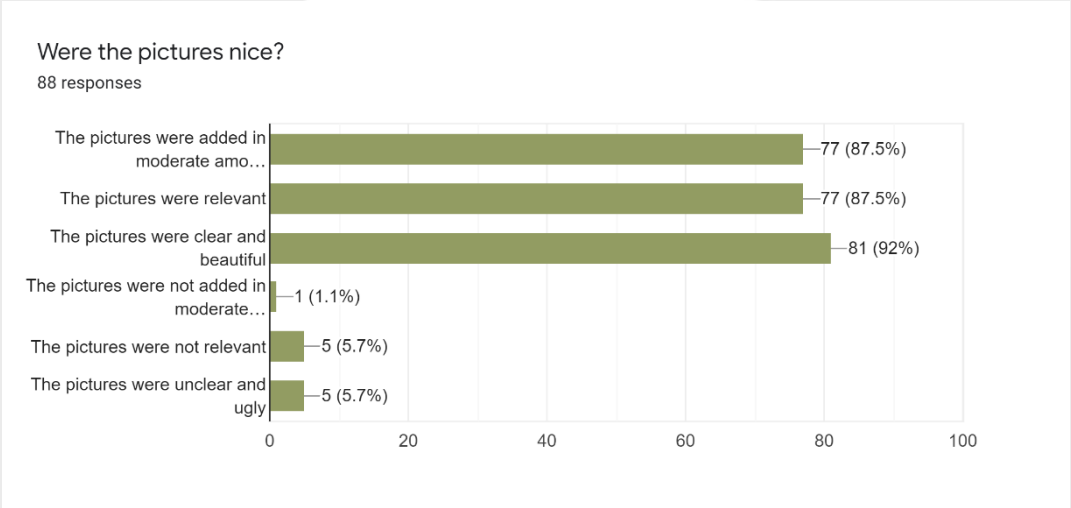
We have reached out to Dr Yeo (https://sg.linkedin.com/in/darrenyeodr) a PhD graduate from the NUS Evolutionary Biology Lab, whose research interests are focused on insect species diversity and ecology, to ask for his opinion and guidance on our project.

He commented that our website has an "[e]xcellent and eye-catching layout with beautiful pictures, highlights diversity of insects. Generally the pages are very well-done, with beautiful images and a nice write-up of the local species." In particular, he said "[t]he bug-finder gives a pretty fun dimension for younger users to help them identify things."

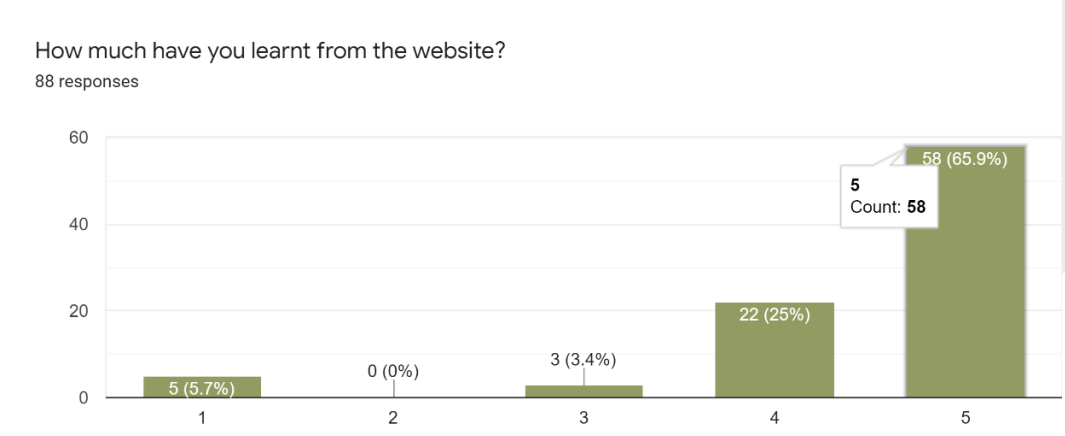


77.3% felt our website was very easy to navigate

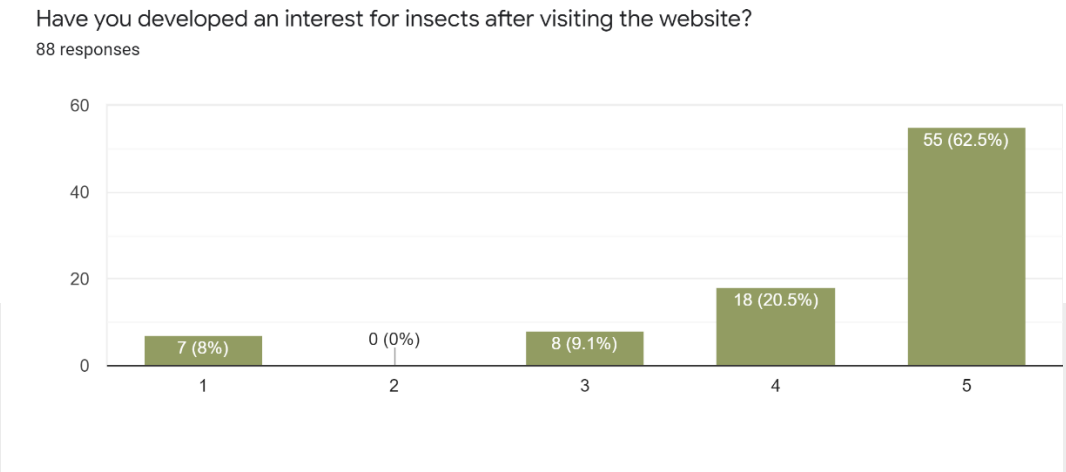




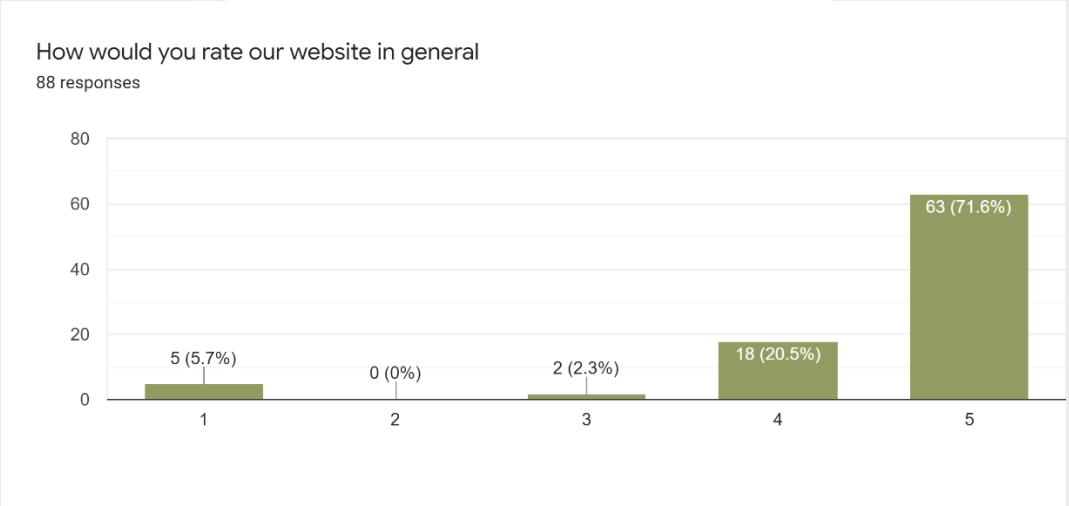
More than 85% felt that the pictures and information were sufficient, relevant, clear and interesting.



65.9% have learnt a lot from our website



62.5% have developed a great interest in insects



71.6% gave a 5/5 for our website and many shared it to others.

Comments:

- Favorite feature was the bug identifier- helps me identify bugs
- Great pictures and interesting information. Found a green bug and now I know its a shield bug after reading your website!
- Extremely well made with interesting information
- Just found out about your website from my friend! Thanks for the beautiful info!!

4. Outcome & Discussion

4.1 Changes Made/Final Outcome

Dr Yeo reminded us that some ants and termites have wings, so we made changes to our bug finder to make it more accurate. Photographers reminded us to use multiple sources to cross reference the pictures and have done so.

4.2 Limitations

There are more species that we have not covered. The literature in a country like Singapore, with a rich biodiversity, is not extensive and not complete.

4.3 Possible Further Works

We could collaborate with NParks to make a resource that visitors can use when they visit the different reserves, like QR codes on signboards. We could expand on the number of insect species we have or even work on the spider species of the reserve.

5. Conclusion

Bukit Timah Nature Reserve is home to many rare forest-dwelling insects. Although there are thousands of species in the reserve, many people do not appreciate or notice them. We hope that through our project, people will be aware about the declining population of insects, gain a better understanding of insects in Singapore and have greater interest and appreciation in them.

References

Bay, N. (2020). Macro Photography in Singapore. Retrieved from https://www.nickybay.com/

Baharudin, H. (2019, May 25). NParks discovers 40 potentially new species of animals in Bukit Timah Nature Reserve. Retrieved from https://www.straitstimes.com/singapore/environment/nparks-discovers-40-new-species-of-animals-in-bukit-timah-nature-reserve

Bukit Timah Nature Reserve - Nature's Gift to Singapore. (n.d.). Retrieved from https://www.locomole.com/stories/bukit-timah-nature-reserve-natures-gift-singapore/

Hallmann, C. A., Jongejans, E., Siepel, H., Hofland, N., Schwan, H., Stenmans, W., … Martin Sorg. (2017.). More than 75 percent decline over 27 years in total flying insect biomass in protected areas. Retrieved from https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0185809

Ho, J., Foo, M., Yeo, D., & Meier, R. (2019). The other 99%: exploring the arthropod species diversity of Bukit Timah Nature Reserve, Singapore. Gardens' Bulletin Singapore, 71(suppl.1), 391-417. doi: 10.26492/gbs71(suppl.1).2019-17 (2019, February 14). Why insect populations are plummeting-and why it matters. Retrieved from https://www.nationalgeographic.com/animals/2019/02/why-insect-populations-are-plummeting-and-why-it-matters/

Bay, N. (2020). Macro Photography in Singapore. Retrieved from https://www.nickybay.com/

Baharudin, H. (2019, May 25). NParks discovers 40 potentially new species of animals in Bukit Timah Nature Reserve. Retrieved from https://www.straitstimes.com/singapore/environment/nparks-discovers-40-new-species-of-animals-in-bukit-timah-nature-reserve

Bukit Timah Nature Reserve - Nature's Gift to Singapore. (n.d.). Retrieved from https://www.locomole.com/stories/bukit-timah-nature-reserve-natures-gift-singapore/

Hallmann, C. A., Jongejans, E., Siepel, H., Hofland, N., Schwan, H., Stenmans, W., … Martin Sorg. (2017.). More than 75 percent decline over 27 years in total

flying insect biomass in protected areas. Retrieved from https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0185809

Ho, J., Foo, M., Yeo, D., & Meier, R. (2019). The other 99%: exploring the arthropod species diversity of Bukit Timah Nature Reserve, Singapore. Gardens' Bulletin Singapore, 71(suppl.1), 391-417. doi: 10.26492/gbs71(suppl.1).2019-17 (2019, February 14). Why insect populations are plummeting-and why it matters. Retrieved from https://www.nationalgeographic.com/animals/2019/02/why-insect-populations-are-plummeting-and-why-it-matters/

National Parks Board. (2015). SGBioAtlas (2.0.6) [Mobile application software]/ Retrieved https://play.google.com/store/apps/details?id=sg.gov.nparks.BiodiversityApp