

The Effect of Temperature and Humidity on Butterfly Larvae Development

State Climate Office of North Carolina

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Introduction/Rationale

The purpose of this project is to see what the effect of an environment with and without humidity would be on the growth of butterfly larvae. We were interested in this project because we wanted to know how big of an impact humidity would have on butterflies, and maybe other biological things in the environment. Our work could help weather stations from all around the area be able to better predict how weather affects the animals.

Research Problem

How did humidity affect the development of the butterfly larvae?

Hypothesis

We think that the butterfly larvae living in the environment with humidity will grow faster.

Materials and Methods

This experiment used the following:

1. 2 Butterfly Chambers
2. Spring Water
3. Samsung Tablet
4. Kestrel environmental meter
5. ThermaPro Thermostat
6. Petri Dishes
7. Paper Towel
8. Butterfly Larvae (Painted Lady)
9. 2 tubs



We have two tubs. The one with moisture has the ThermoPro thermostat, the one without moisture has the Kestrel meter. We put butterfly larvae in both at the same time, and we checked on them regularly around 10:50 AM every day. When we checked we always made sure water (wet paper towel) was always in the moisture tub. We made sure to poke holes in the tubs so they won't get overheated and there was air. As we checked on the larval growth, we recorded data such as relative humidity, temperature, and observations.

Results

Effect of humidity and temperature on Butterfly larvae development

Date	Trial One			Trial Two		
	Tub One (no moisture)			Tub Two (moisture)		
	Temperature (C)	Relative Humidity %	Observations (stage of larval development) and Pictures	Temperature (C)	Relative Humidity %	Observations (stage of larval development) and Pictures
3/19/19	22.7	32.8	Lots of cocooning	21.9	90	Little cocooning
3/20/19	33.4	83.4	Most started hanging	22	83	All started hanging
3/21/19	22.8	49.7	They are only hanging	22.2	87	chrysalis have started to form
3/22/19			Wings are growing	22.1	84	Wings are growing
3/25/19			chrysalis fully formed	22.4	38	chrysalis fully formed
3/26/19			No chrysalis have fallen	22.1	84	One chrysalis has fallen
3/27/19			No chrysalis have fallen	22.3	41	One chrysalis has fallen

Date	Trial Two			Trial One		
	Tub One (no moisture)			Tub Two (moisture)		
	Temperature (C)	Relative Humidity %	Observations (stage of larval development) and Pictures	Temperature (C)	Relative Humidity %	Observations (stage of larval development) and Pictures
4/11/19	24.8	50.4	Webbing	22.2	63	There is little webbing
4/15/19	23.4	58.4	Some chrysalis are forming	22.9	89	Few chrysalis have formed
4/16/19	22.7	43.3	They have all cocooned	21.9	86	They have all cocooned
4/17/19	22.6	42.1	Wings are forming	22	88	Wings have begun to form

In the first trial, the butterfly larvae with humidity grew moderately faster, the information we gathered was very constant except for on about 4 days when the tablet failed. In the second trial, the butterfly larvae with humidity grew only a little bit faster at the beginning, after that the information we gathered was pretty much the same.

Discussion of Results

In part our hypothesis was true, the butterflies with humidity did grow faster but it was only a moderate difference. When we did our second trial wasn't really credible because the data was shortened by school vacation. If we restarted on our project we would probably give them more water, and make sure that we check everyday so that we won't have empty spots like it was this time. We did 2 trials but we will do more next time for more accurate data.

Conclusion

We have concluded that the butterflies with humidity will grow moderately faster, but for a more accurate conclusion we would have to do more trials.

References and Acknowledgements

References

- <https://monarchbutterflygarden.net/control-aphids-milkweed-plants/>
- https://plants.usda.gov/plantguide/pdf/cs_astu.pdf

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