The Effects Of UV-B Radiation on The Basking Behaviors of Lepidodactylus lugubris

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Abstract

Lepidodactylus lugubris is a cathermal reptile that is well known for its parthenogenetic abilities. Little to no research has been conducted on the basking behaviors of reptiles that are not diurnal. For our study we wanted to see how the mourning geckos differed in the way they wanted to bask based on whether they were offered basking areas with UV-B radiation, or not. Four enclosures were created housing four geckos each inside. Two enclosures were offered UV-B radiation and two were offered LED bulbs as their basking area. We then recorded the total amount of minutes the geckos were on the platform for each enclosure was recorded. Due to technical issues, data collection was interrupted and only a small amount of data was able to be collected and analyzed for the presentation. Our preliminary founding showed that there was a difference in the amount the control and experimental group desired to bask. Enclosures with UV-B basked 52.78% of their daytime basking (7:00-18:00), whereas the control group spent 34.34% of their time basking.

Introduction

Looking at thermoregulation and vitamin synthesis, these processes are fundamentally linked. It is commonly understood that reptiles will bask under warm lighting for thermoregulation, but what if that is not what the reptiles are looking for? Reptiles can adjust their basking behavior based on not just base where to bask based on the temperature that is projected. There have been multiple studies indicating that more goes into the basking behaviors, with one study published to the Journal of Herpetology by Gary Fergeson indicating that in the species *Anolis sagrei*, the basking behavior would decrease with higher amount of dietary vitamin D_3 what was in their diet. This indicates that the *Anolis sagrei* will use UV-B radiation as a factor in their decision to bask (Ferguson 2013). In addition, a study published to the British Ecological Society by Dane A. Conley and Matthew S. Lattanzio found that *Sceloporus undulatus* regulate their basking behavior to where the optimum UV-B exposure would be. They found that the Sceloporus undulatus would even rather withstand temperatures 6°C higher than their critical thermal maximum of 40°C (Conley 2022)

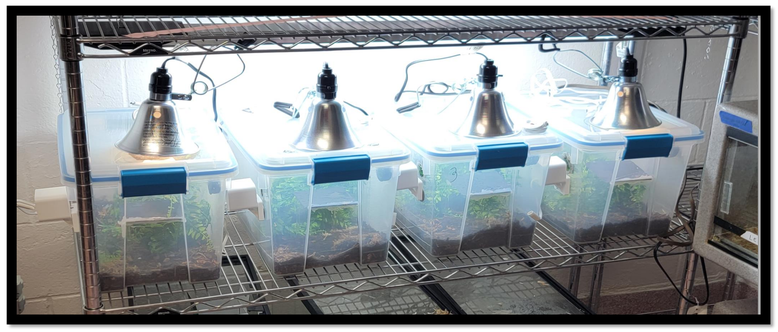
These studies indicate that there is much more we need to learn about how reptiles determine the optimum area to bask. Very little research has been done indicating how these animals regulate their UV-B.

Conclusion

Reptile behavior is an understudied aspect of science and there is so much more we need to learn about these animals for the improvement of their captive care. The more that we know about these animal in the wild, the better we can keep them in captivity, and will allow for an overall better advancement of research

Methods

All enclosures included a platform for a feeding station, a plastic plant, and a larger platform below a basking area. Two of the enclosures contained an LED light, and two of the enclosures contained a low wattage Zoomed UV-B bulb that projects a UVI of 0.9-1.1. Wyze v3 camera were ised to record footage of basking behaviors. The total amount of minutes spent on the platform was recorded. All twelve geckos were fed *Arcadia Reptile EarthPro-StickyFoot Gold Gecko Food* ™ 5 times a week . They were also fed flightless fruit flies once a week that were supplemented with *Rep-Cal Herptivite with Beta Carotene*.



Preliminary Results

Unfortunately, the data analysis was unable to be completed. There were major errors and problems with data collection and do not have a complete set of data. For now, we can look at the sections of data that have been worked on as of 11/22/24. Looking at figure one, you can see the data table and the 100% stacked column. This shows you hour by hour what percentage of basking behaviors were observes by each enclosure. The second chart is a bar graph that shows the percentage that MGE-1 and MGE-2 each basked for. This data should be more in depth but due to limited data, we could only use one days' worth of footage for one control enclosure, and one experimental enclosure. The experimental enclosure spent 52.78% of their daytime basking (7:00-18:00), whereas the control group spent 34.34% of their time basking during the day.

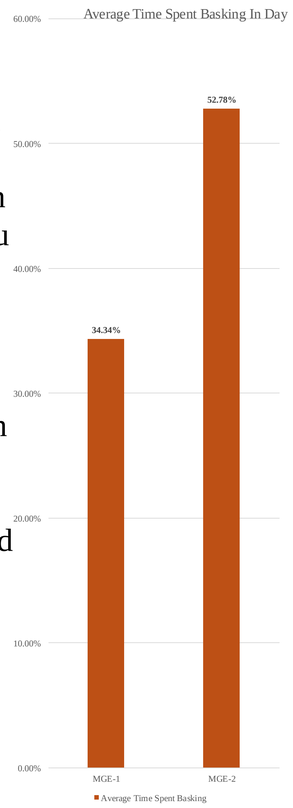
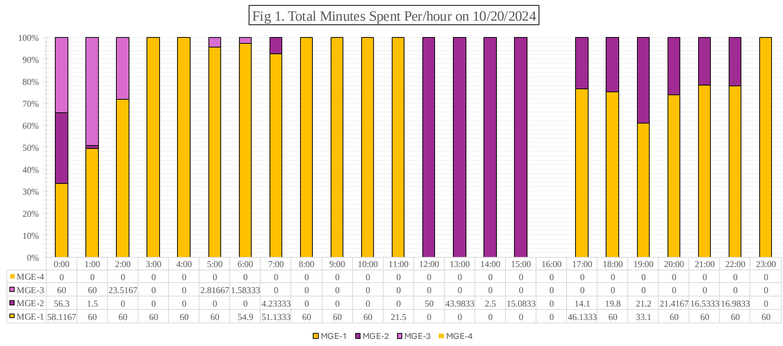


Fig 1. Total Minutes Spent Per/hour on 10/20/2024



	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
MGE-4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MGE-3	60	60	23.5167	0	0	2.81667	1.58333	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MGE-2	56.3	1.5	0	0	0	0	0	4.23333	0	0	0	0	50	43.9833	2.5	15.0833	0	14.1	19.8	21.2	21.4167	16.5333	16.9833	0
MGE-1	58.1167	60	60	60	60	60	54.9	51.1333	60	60	60	21.5	0	0	0	0	0	46.1333	60	33.1	60	60	60	60

Discussion

Overall, are findings are incomplete, but from the data that was analyzed, there seems to be some positive preliminary findings about the differences between how these geckos engage in their basking behavior. Firstly, it would prove that there is an evolutionary adaptation for these animals to seek out UV radiation, rather than pure light levels overall. In addition to this seeming to support the findings of the other research paper, this would seem to match how their theoretical behaviors would manifest themselves in the habitat they evolved into. These geckos are very small and come from regions that do not encounter large amount of high energy sunlight. At any temperature above 85°F they are more likely found to be hiding, rather than basking. It is shown though that these animals do have a tendency to enjoy basking, so it would make sense that these animals would rather seek out UV-B radiation as their indicator to bask, rather than heat or light specifically. This is also compounded with the fact that these geckos are parthenogenetic. This means that proper calcium and vitamin absorption would be hugely beneficial for their wellbeing and egg production.

References

The references are anyone to view and analyze. For consolidation you can either scan the QR code to the right or contact **marinellijd7014@delval.edu** for the full reference list. There will also be in person copies available.