

UVB Avoidance in *Dendrobates azureus* Tadpoles

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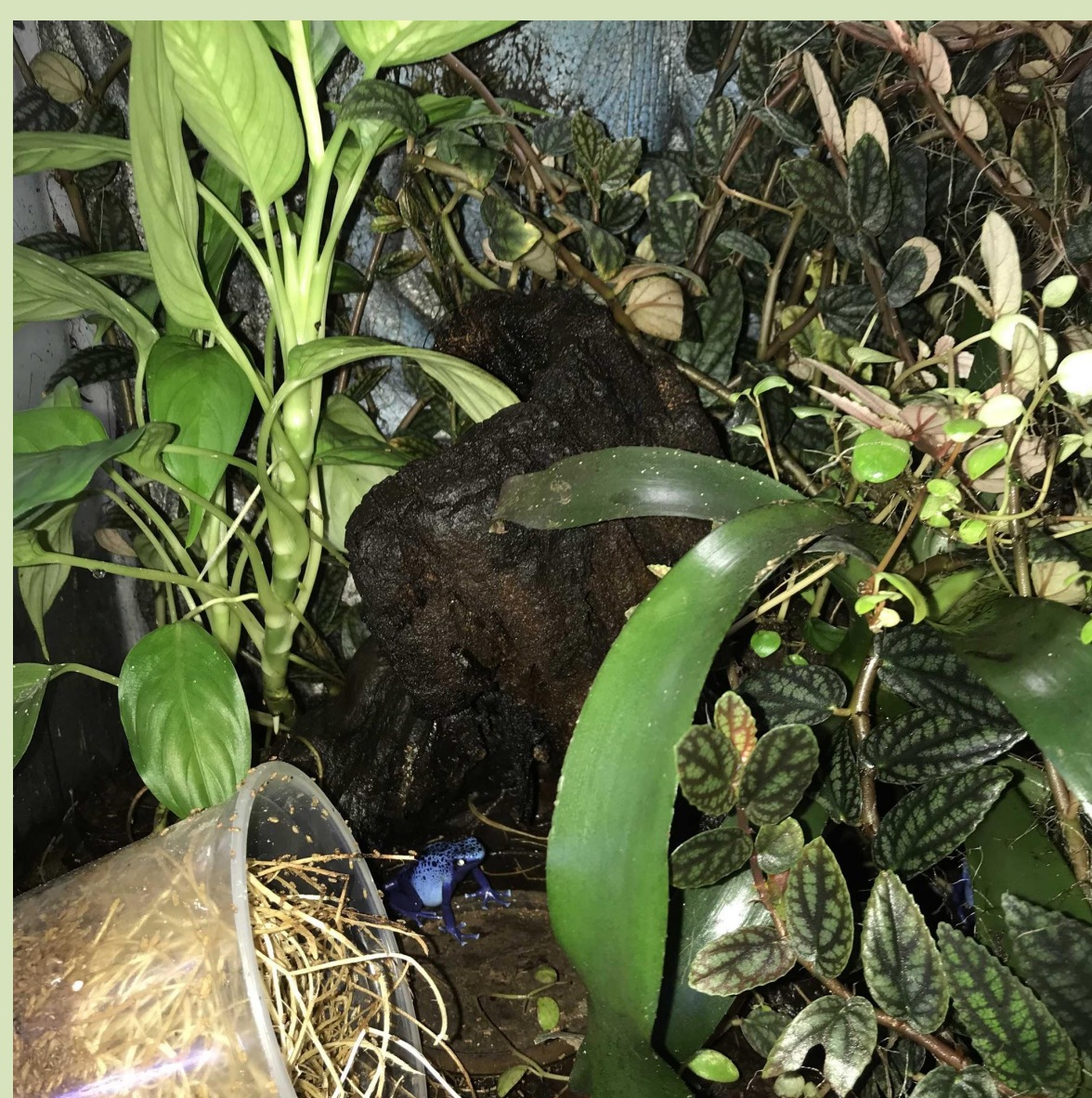


Introduction

Recent amphibian population declines around the world has been a topic of special concern in conservation biology (Beebee and Griffiths, 2005). Factors such as predation, climate change, and increased exposure to UV have led to subsequent population. Previous studies have found that amphibians that live in areas exposed to UV, have adapted a behavioral avoidance towards UV (Blaustein et al., 1994). Dart frogs are a particularly peculiar group of amphibians compared to other groups, as they are one of the few that is diurnal. The issue that comes from this diurnal lifestyle is that The frogs are exposed to massive amounts of UV rays and unlike other species of diurnal animals, dart frogs lack hair or scales that would protect them from the the UV rays. The skin of the Dart frogs is thin and delicate and would be harmed by UV rays, so how do they deal with the large amount of exposure to UV light? Studies done In the La Selva, Costa Rica show that adult dart frogs actively avoid UV light (Han et al., 2007). To show that this is a behavior displayed throughout the species life, the decision was made to test the tadpoles. This would be the first time a study like this would ever be conducted. For the experiment The species *D. azureus* were chosen as the test subjects because the Pepperdine Natural Science Division breeds them in house. The species *P. regilla* was chosen as a comparison species.

Methods

1. Three tadpoles of each species were individually placed into shoe box sterilite tubs, filled with carbon filtered water. Each tadpole was exposed to one of three different lighting conditions: UV, visible and no light. A structure to allow refuge from the lighting conditions would be placed in the center of the tubs.
2. Tadpoles were given an hour to acclimation period.
3. Data was taken every 30 minutes for a 6-hour period. The data was just to observe whether the tadpoles were under the structure or out in the open exposed to the lighting condition.



Abstract

Most frogs are nocturnal, but dart frogs (Dendrobatidae) are diurnal and lack scales or hair that would protect them from UVB rays. Previous studies have demonstrated that adult dart frogs avoid UVB light. The purpose of this experiment was to test whether dart frog larvae would avoid UVB light when compared to local nocturnal treefrog larvae. For the experiment we used tadpoles of *Dendrobates azureus* and *Pseudacris regilla*. The tadpoles were put in tubs with a submerged shelter and exposed to 3 lighting conditions: UVB, no light and visible light. The tadpoles were exposed to only one lighting condition each trial. They were exposed to these conditions for 6 hours and observations were taken every half hour to note if tadpoles were under the shelter or out in the open. The results demonstrated that both species of tadpoles did not appear to increase shelter use when exposed to no light or visible light. However, for the UVB condition dart frog tadpoles used shelter significantly more than *P. regilla* tadpoles. In conclusion this experiment demonstrates that dart frog tadpoles are appear more sensitive to UVB than local treefrog tadpoles.

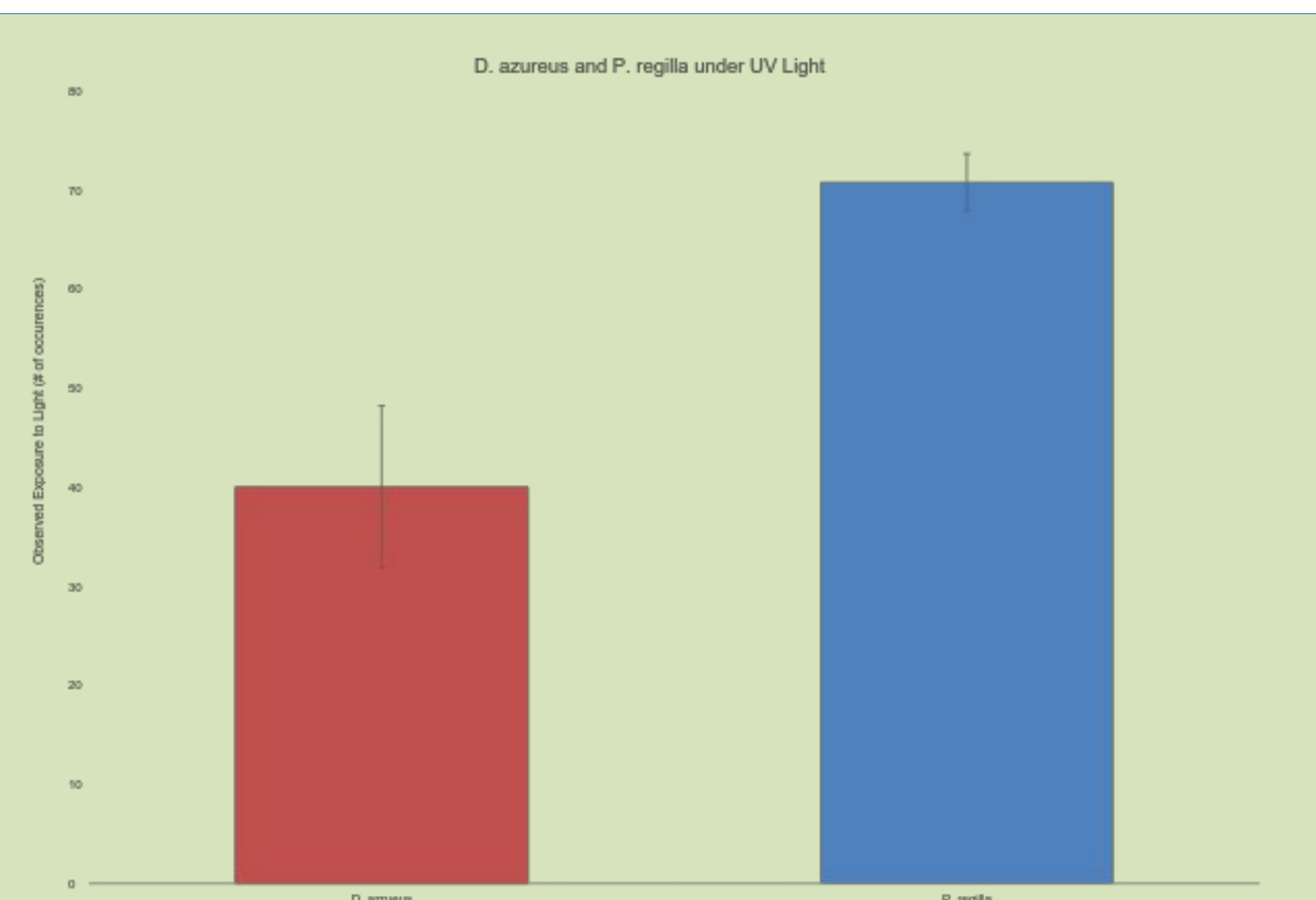


Figure 1: This graph shows the mean for the amount of times each species of frog was observed out in the open

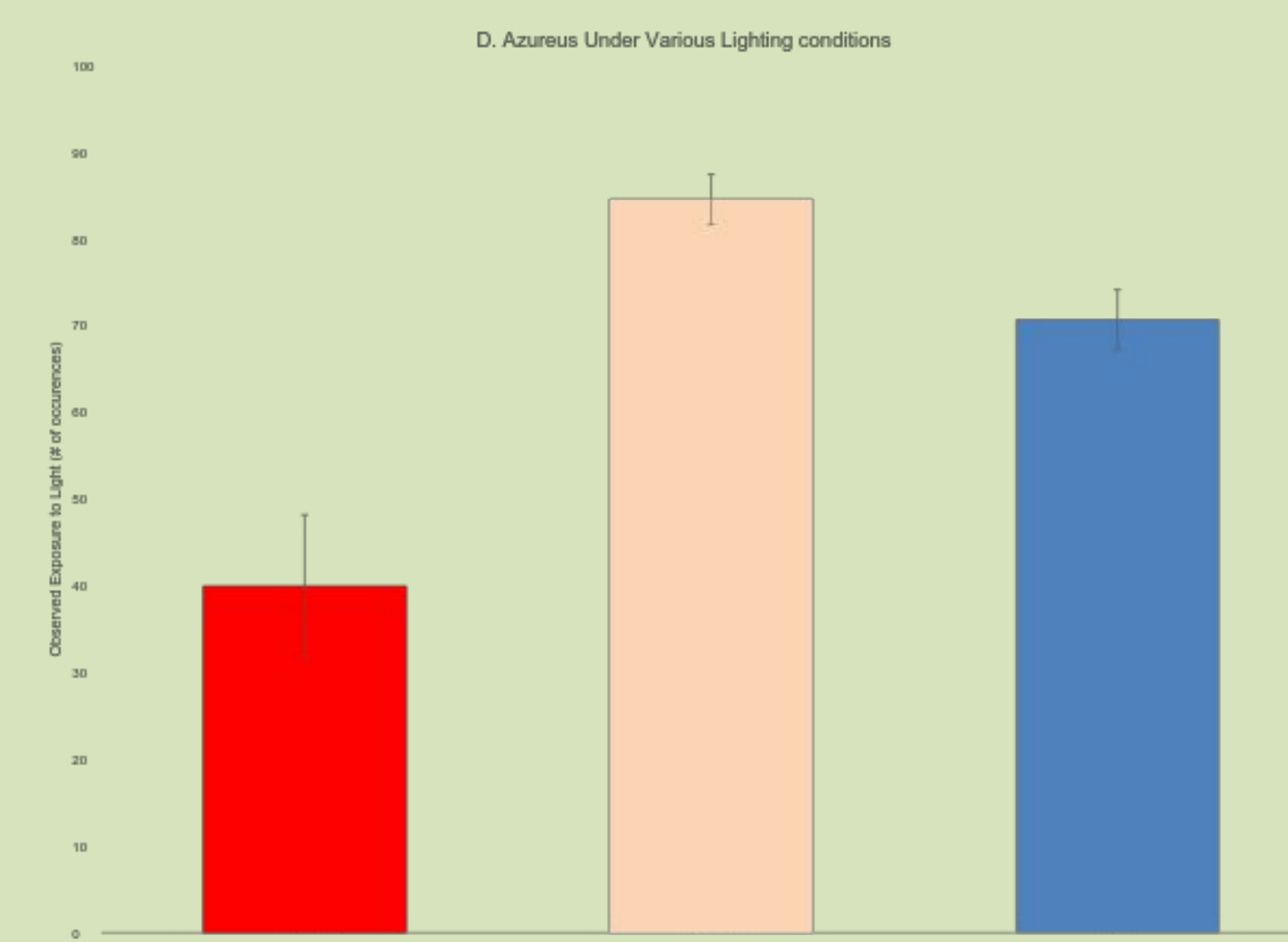


Figure 2: This graph shows the mean amount of times *D. azureus* was observed under each lighting condition.

Conclusion and Discussion

The results show that the mean observed time's the tadpoles exposed themselves to UV lighting were 40 for *D. azureus* and 70.74 for *P. regilla*, this is important because it shows that the *D. azureus* actively avoided the UV condition more than *P. regilla*. For the data on the dart frogs under the three lighting condition, for exposure of UV light the mean was 40, Visible Light 84.6 and No Light 70.74. This shows that *D. Azures* actively avoided the UV Lighting Condition more than the other three conditions. This Supports the theory that dart frog actively avoid UV light. Looking forward the same lighting experiments will be performed on the juveniles and the adult frogs. Another experiment that will branch out from this is the rearing of young dart frogs under complete UV light, to observe the affects on the developing frogs' bodies. Overall it is important to find out why *D. azureus* actively try to avoid exposure to UV Light.



Literature Cited

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