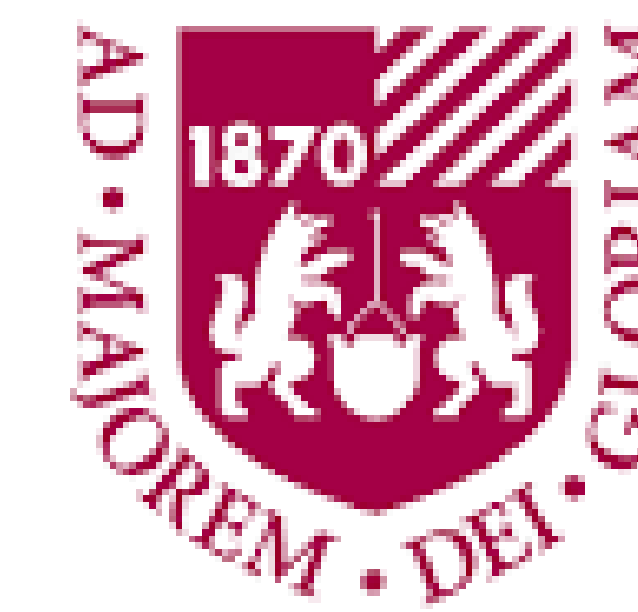


# Developmental Constraints of Toe Length on Scale Count

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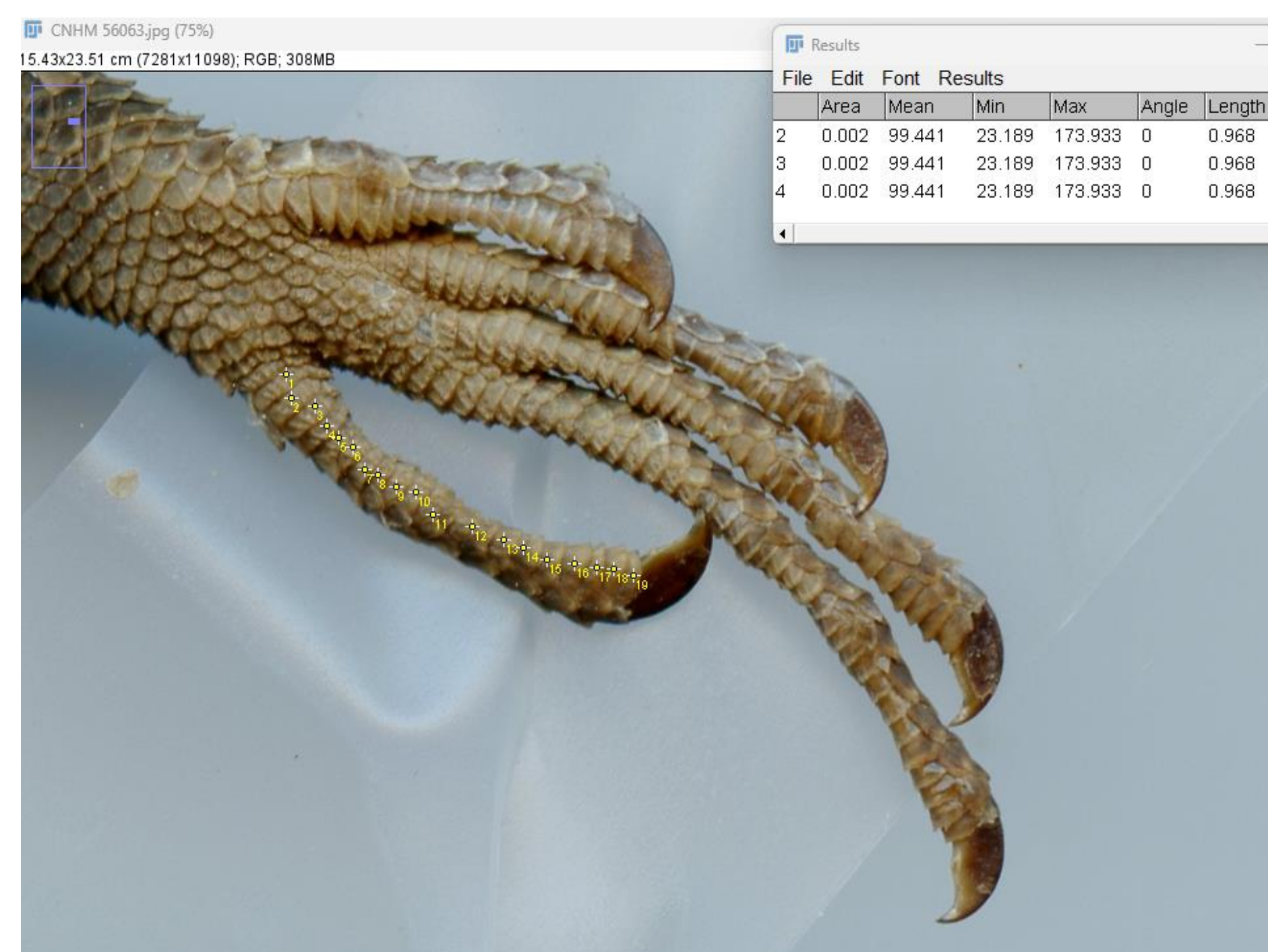
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## Background

Lizards have been able to develop evolutionary innovations, which are new structures that allow them to access new adaptive zones. One such innovation is the development of adhesive toe pads. This trait has evolved independently 16 times in 3 major groups of lizards. Adhesion is achieved through the use of specialized scales on the expanded region of the plantar surface of the toe pad, which creates a force known as van der Waals force. This new innovation allows for improved locomotion in vertical habitats. Previous research has shown that the adhesive toe pad scales develop in a distal to proximal direction.

The developmental pattern of adhesive toe pads differs from that of non-adhesive toe pads, which can have implications for other traits. To investigate this, I collected data on specimens without adhesive toe pads and examined the developmental pattern of their scales. I predicted that scale count would be controlled by length.

## Methods

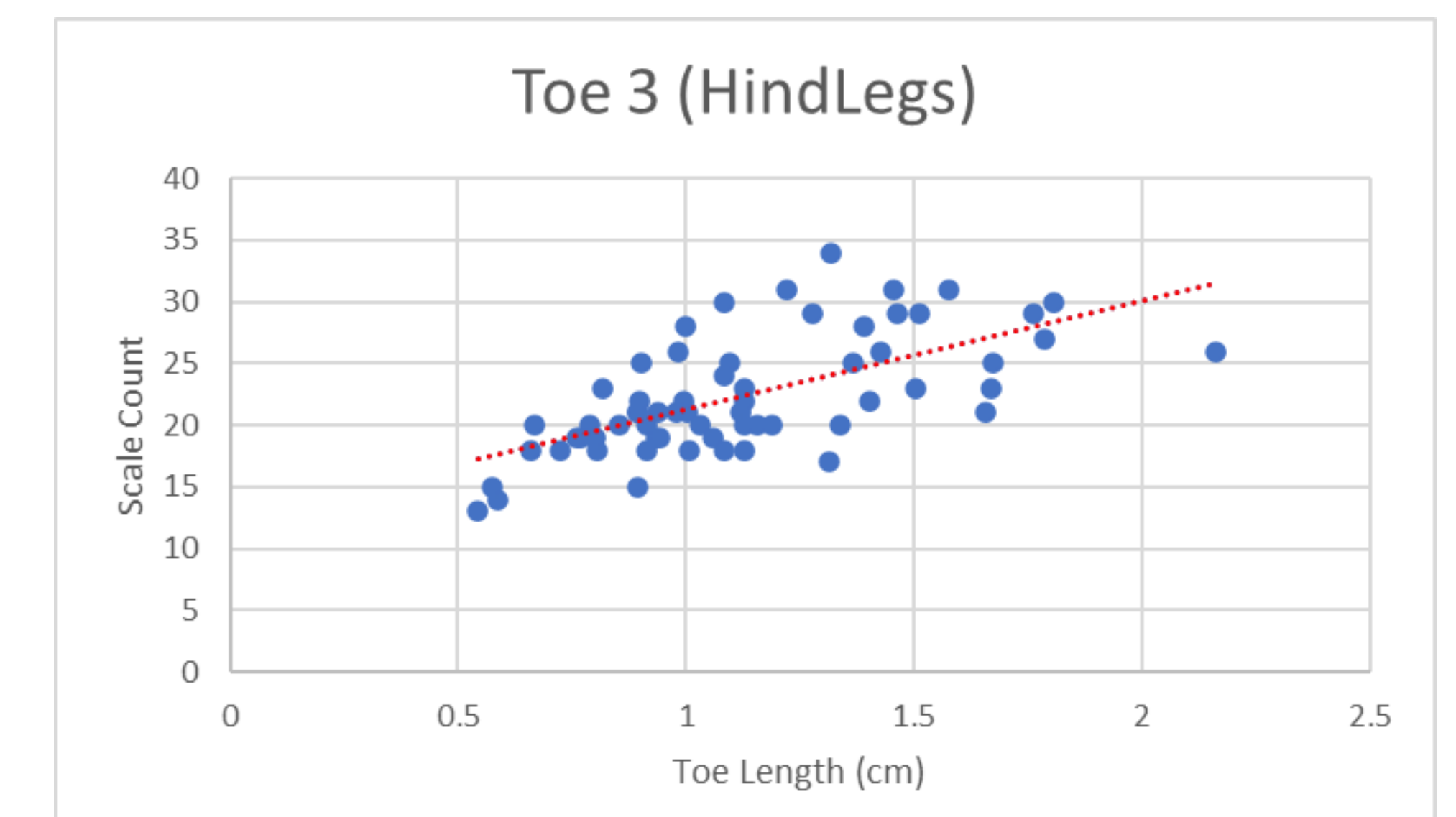
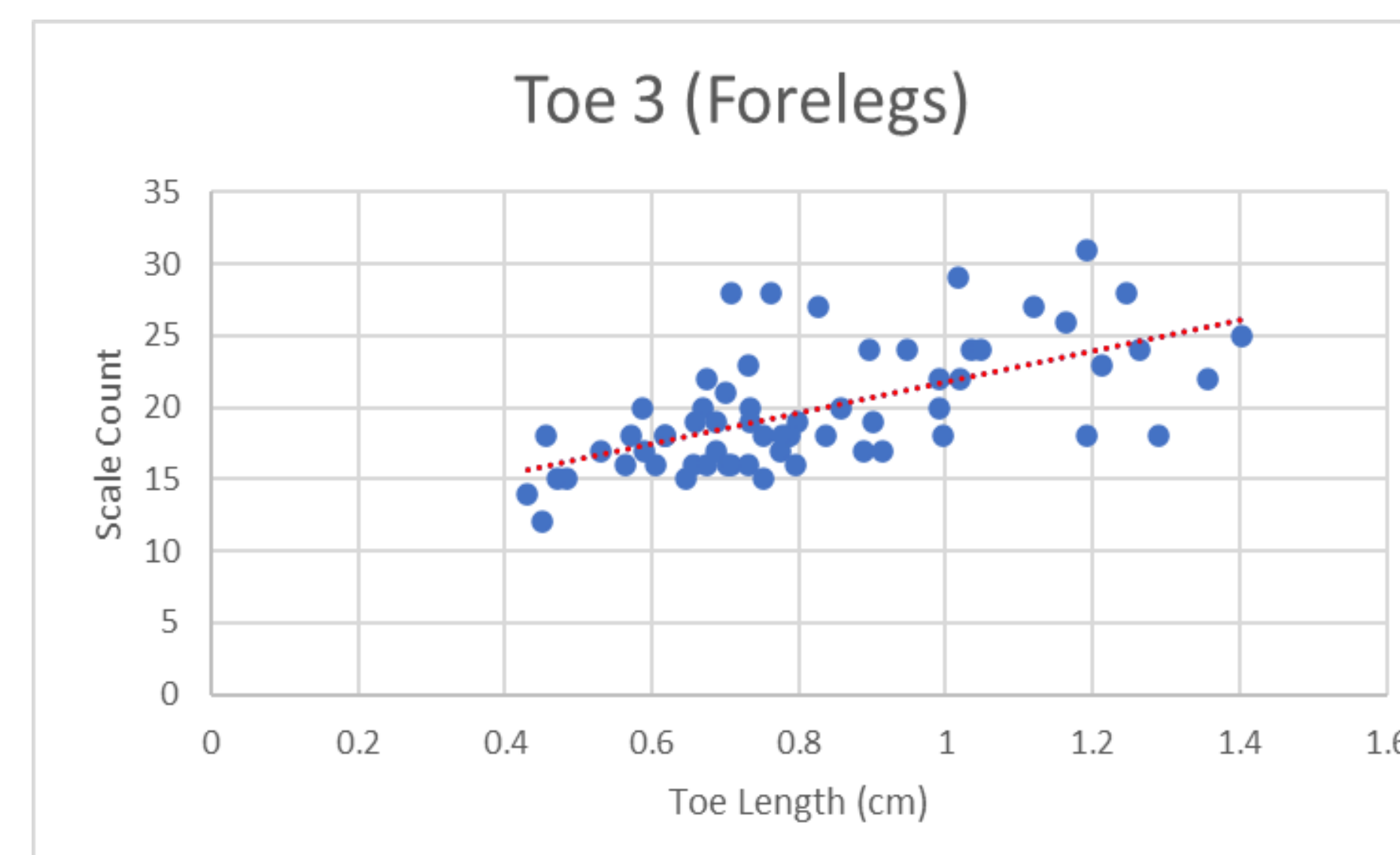


All of the specimens used in this study were obtained as loans from museum databases.

The specimens were scanned using a scanner and the resulting scans were analyzed using Fiji Photo Editor.

A set scale was used to measure each entire toe, and the scales were then counted for each individual toe pad on both the hindlegs and forelegs.

## Results



Graphs were created for each toe on both the forelegs and hindlegs using all of the data collected from the specimens. The purpose was to investigate whether toe length controls for scale count. The results of every graph showed a positive trend.

## Discussion/Conclusion

Based on the positive trend observed in the results, it can be concluded that the developmental pattern for scale formation in non-adhesive toe pads is controlled by the length of the toe pad. The next step in this research would be to collect and compare data from species with adhesive toe pads to determine whether they follow the same pattern. If they do not, it would be important to identify the alternative developmental pattern. This would further support the idea that the developmental constraint imposed by adhesive toe pads leads to different developmental patterns.

## Acknowledgements

Thank you to the contributions made by



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## References

Griffing et al. 2022. BJLS