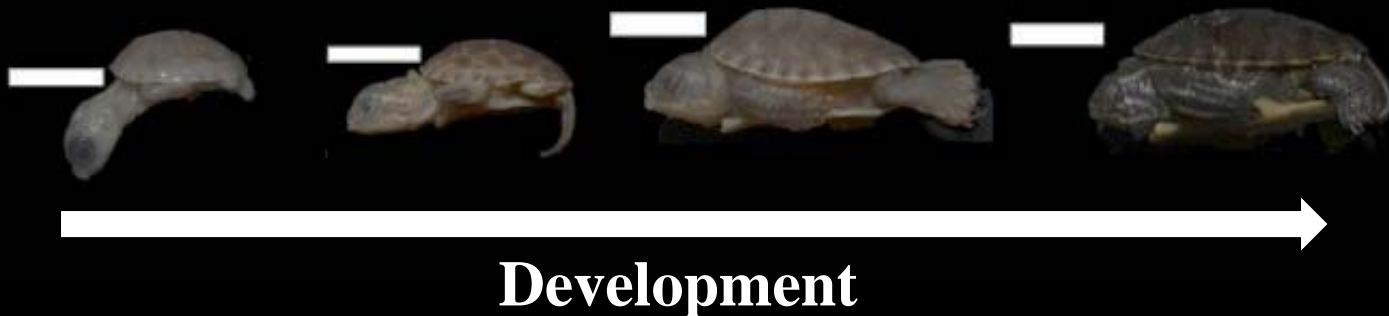


IOWA STATE UNIVERSITY

MCNAIR PROGRAM

A novel modification of the tetrapod scapula during development of turtles with shell closing systems

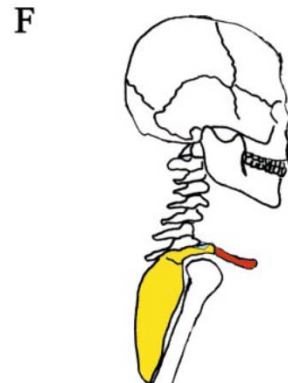
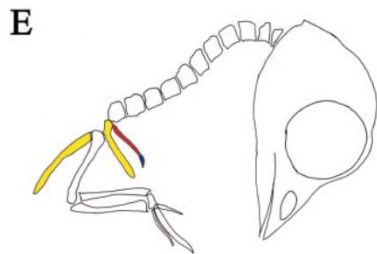
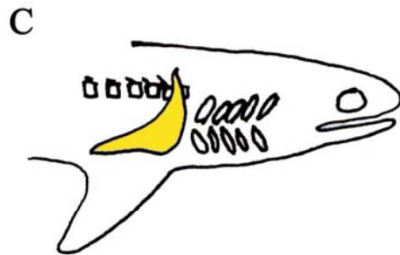
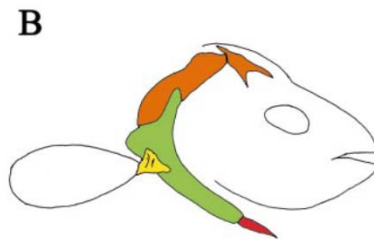
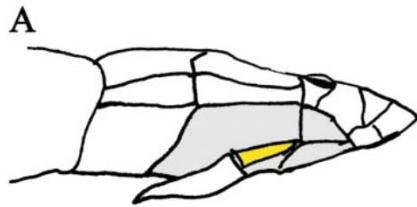
Department of Ecology, Evolution, and Organismal Biology
Kevin Quinteros, G.A. Cordero, and F.J. Janzen



Outline

1. Background
2. Research Objective
3. Methods and Results
4. Conclusion
5. Continued Research

The Shoulder Girdle

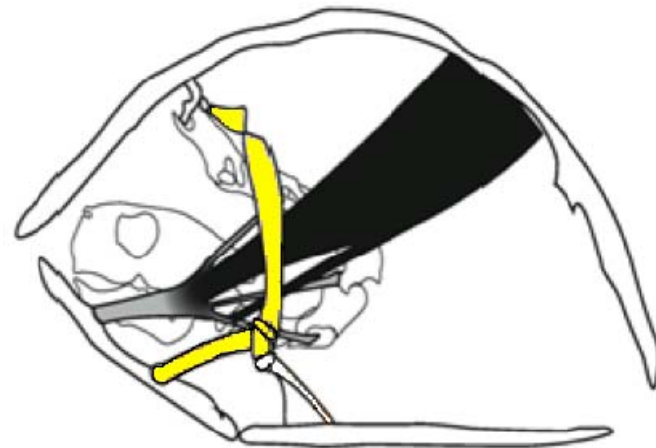
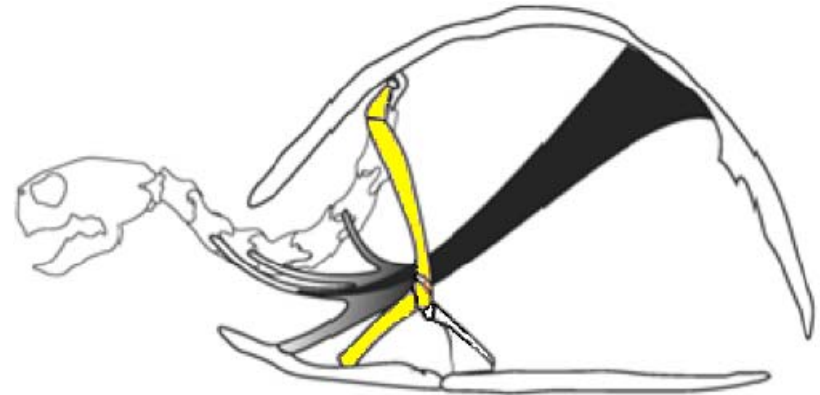


- The loss or reduction of bones.
- Great diversity within vertebrates.
- Turtles are the most recognizable exception.

McGonnell 2001

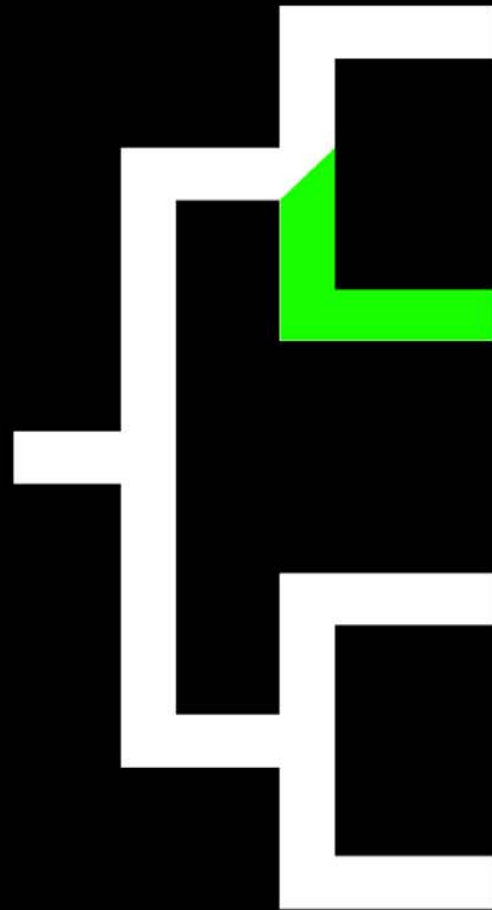
Turtles

- Turtles are unique that the shoulder girdle is inside shell.
- Skeletal modifications that may have accompanied shell evolution
- Shell Closing System in Box Turtles.



Research Objective

Identify the developmental process underlying the unique adaptation of the shoulder blade in Box Turtles.



CJ 20



CJ 20



F 22



HH 36



CJ 21



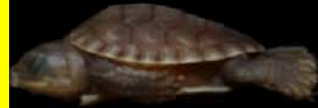
CJ 21



F 23



HH 38



CJ 22



CJ 22

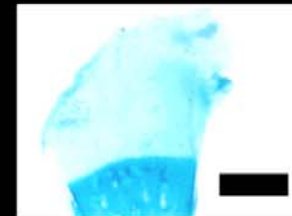
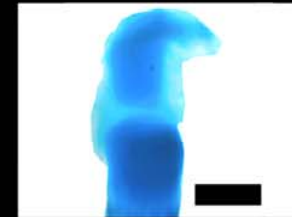
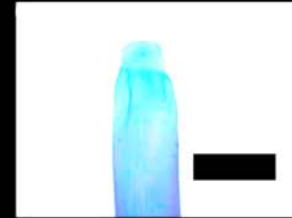


F 24

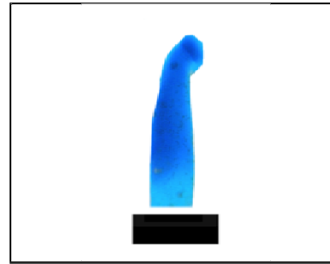


HH 40

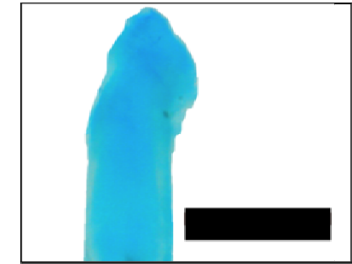
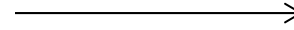
Shoulder girdle



Turtle

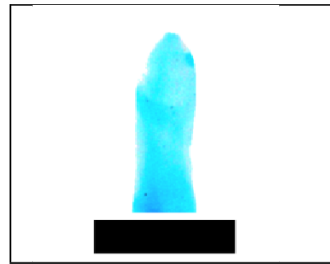


CS 20

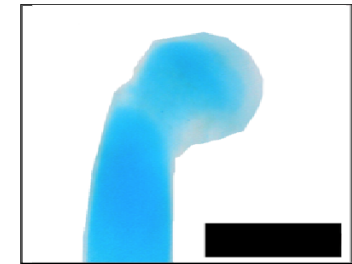
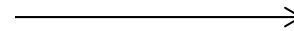


CS 21

Box Turtle

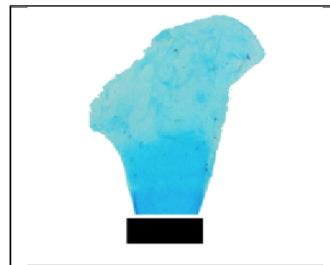


EB 20

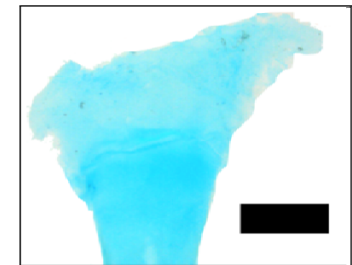
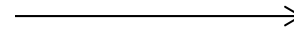


EB 21

Alligator



AM 20

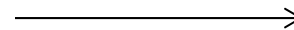


AM 21

Chicken

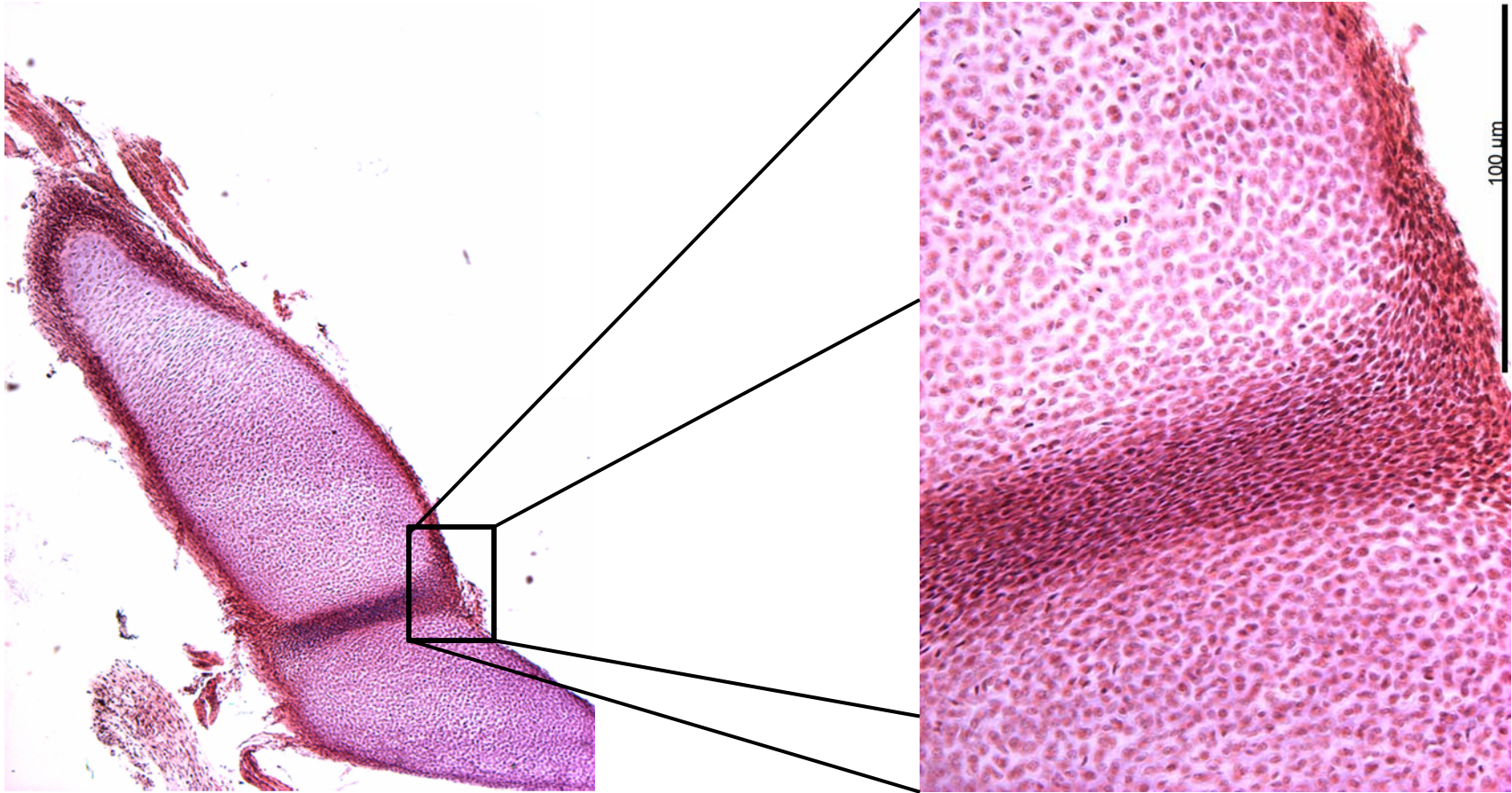


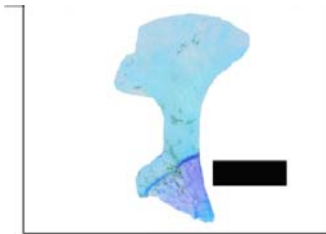
GG 20



GG 21

Evolutionary innovation

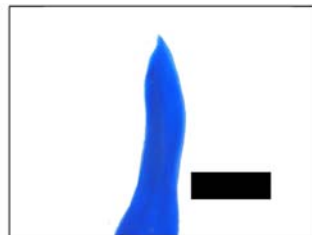




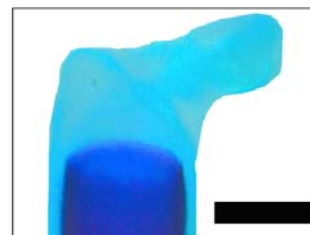
Alligator Lizard



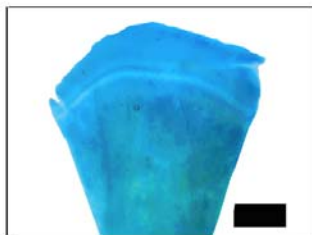
Painted Turtle



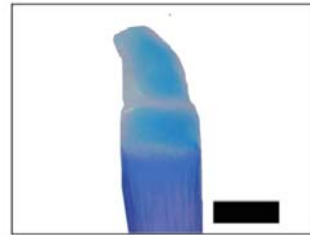
Spade Foot Toad



Soft Shell Turtle



Rat



Blanding's Turtle

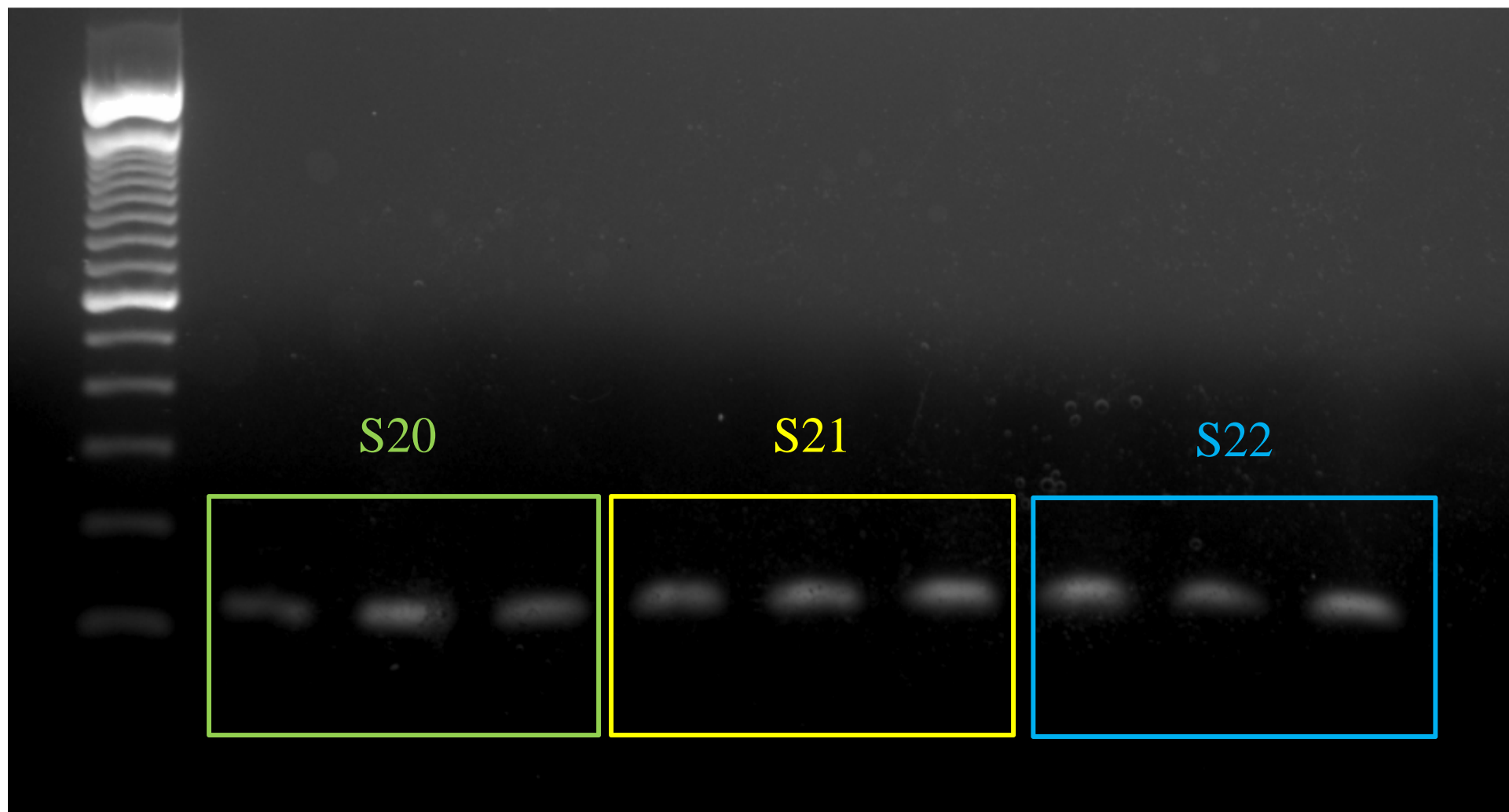
Conclusion

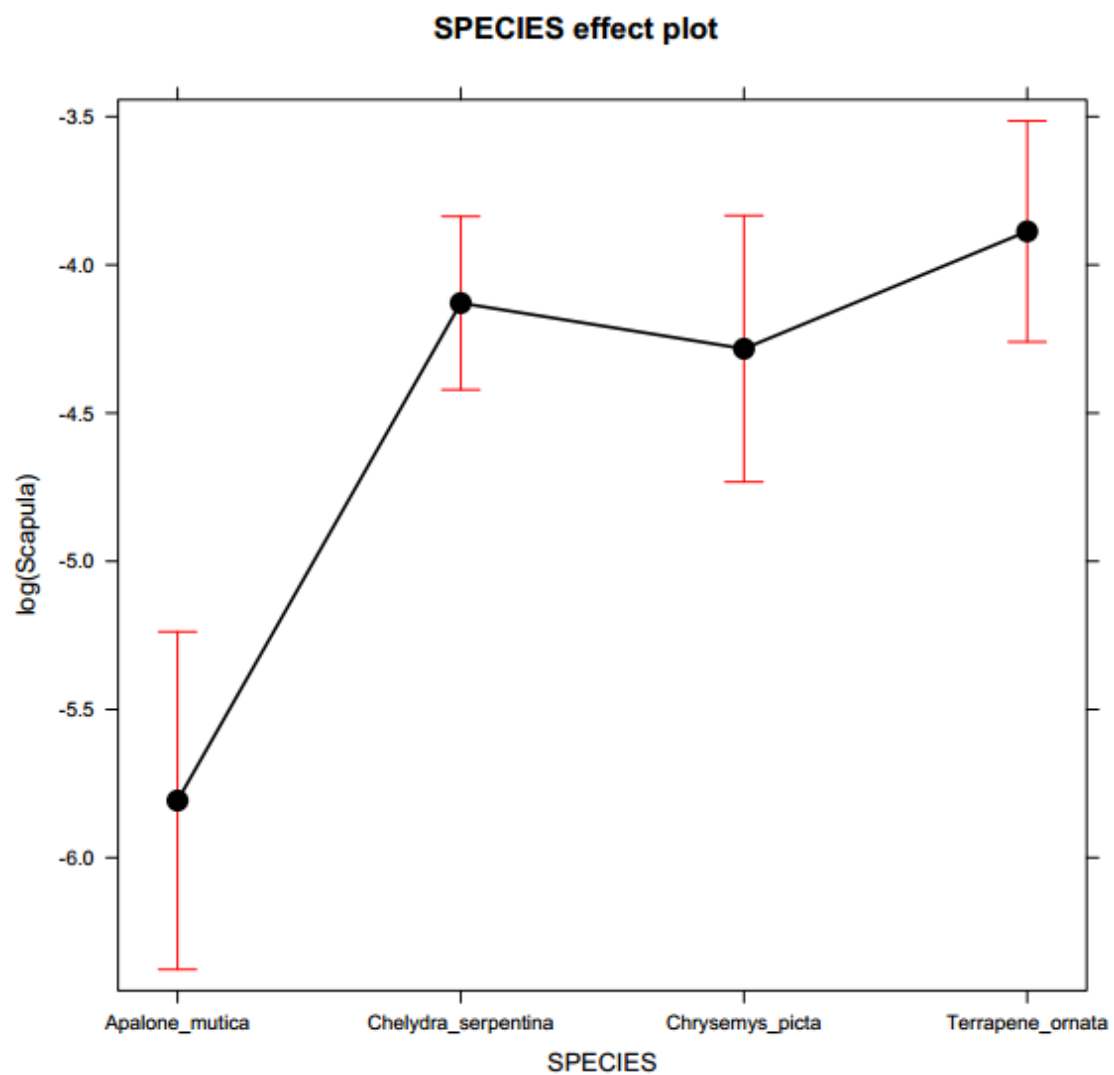
We provide the first description of a turtle specific developmental process required for a unique adaptation of the basic vertebrate body plan.

Continued Research

Developmental gene has been isolated.

**How does switching the gene on/off
affect development?**





Acknowledgements

I thank the members of the Janzen lab for the assistance in the sample collection . I would also like to thank Antonio Cordero for the help with my project.

Questions