

Stockton Students Explore How Unborn Animals Communicate That It's Time to Hatch

Can Diamondback Terrapins Synchronize Hatching Like Birds?

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Galloway Township, NJ- Students at The Richard Stockton College of New Jersey are recording the sounds of baby quail hatching, part of an experiment to learn more about how certain species communicate with each other even before birth.

These experiments are designed to help the students develop a model that can be applied to similar research with terrapins later this spring. They ultimately will be researching whether diamondback terrapins can synchronize their hatching as do birds, the descendants of reptiles.

Certain species of turtles seem to hatch together and others do not, according to his students' review of literature on the topic, explained Dr. Guy Barbato, a visiting associate professor of Biology at Stockton. He noted that turtles do not make sound, as birds do, which makes it even harder to understand how a clutch of terrapin eggs could communicate that it's time to hatch.

The students are using Japanese quail eggs, which are about the same size as terrapin eggs, to collect sound data and analyze the hatching pattern in the species.

Unborn birds have the ability to hear through their eggshells, which enables a clutch of eggs to hatch all at once, even though they were all laid by one hen over a period of days.

The unborn birds communicate through a sound made when the first chick's tooth punctures its egg's air cell during the hatching process. The sound is likened to a gasp for air. As soon as the first bird takes its first breath, the other birds hear the noise inside their shells.

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Consequently, the first to hatch begins to slow down and the others begin to speed up on cracking their shells, synchronizing their births.

Barbato said he tells his students to “think big and think broad,” and not to assume that all of the big discoveries have been made already.

The Biology students working with Barbato on the project are Tim Fisher of New Egypt, NJ, Jessica Wessel, of Eatontown, NJ, and Ryan McVeigh of West Deptford, NJ.

Dr. Neil Aaronson, an assistant professor of Physics who advises Stockton’s a capella groups, got involved when a student singer who is also part of the quail experiment asked for help with making better sound recordings.

Initially, the recording equipment was limited to available resources including a Styrofoam box, an iPod microphone and a busy room in F-Wing to conduct the recordings. With Dr. Aaronson’s help, the project quickly became an example of an interdisciplinary collaboration between the biology and physics programs.

“The quail eggs are separated into different groups and isolated acoustically in the physics lab sound room, which is soundproof at the frequencies needed. The setup is gloriously simple,” explained Dr. Aaronson.

Measurement microphones are placed close to the eggs and fed to a computer which records the sound for hours at a time.

The eggs are kept in an incubator at 85-percent humidity and 99 degrees Fahrenheit and are rotated by one-third, three times per day. Once the eggs hatch, they are fed chick or turkey starter in Stockton’s lab and kept at a 95-degree temperature.

The striped chicks “look like bumblebees with feet,” said John Rokita, principal lab technician.

Once they hatch, Rokita cares for the chicks and facilitates their adoption when they are old enough. One group has already been adopted.

On Friday, April 19, the students will present their research findings thus far during the School of Natural Sciences and Mathematics Research Symposium in the C/D Wing Atrium on the main Galloway campus from 3-5 p.m.

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