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Survival of the Weakest

Abigail Meisel

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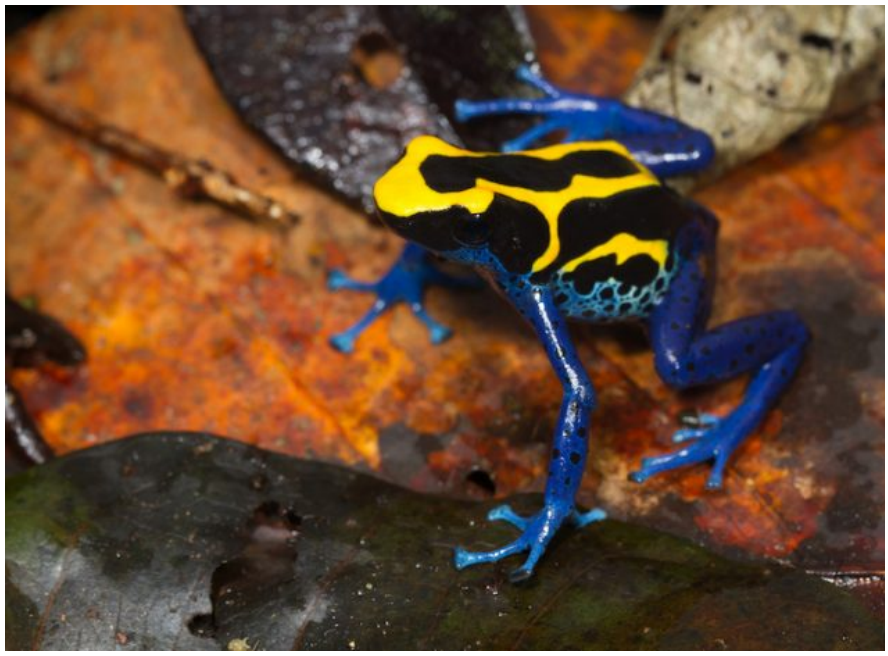
UM professor Brice Noonan puts new spin on evolutionary biology

OCTOBER 21, 2019 BY **ABIGAIL MEISEL**



UM biologist Brice Noonan studies color variations in poison dart frogs, such as this dyeing poison frog (Dendrobates tinctorius) from the Kaw Mountains of French Guiana. Photo by J.P. Lawrence

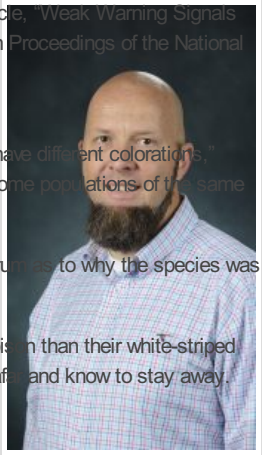
OXFORD, Miss. – When he was a teenager in south Florida, Brice Noonan discovered a new love that ultimately shaped the course of his life.

"I became enamored of frogs in high school," said Noonan, an associate professor in the **University of Mississippi Department of Biology**.

His fascination increased when he learned about a specific species of South American frogs: poison dart frogs, so-called because several indigenous peoples have used them to tip blowgun darts. The frog secretes a life-threatening bitter poison as its natural defense.

Noonan discovered a store near his childhood home that imported reptiles and amphibians, including poison dart frogs, so he had a ready supply to study.

Decades later, his homespun investigations evolved into the scientific article, "Weak Warning Signals Can Persist in the Absence of Gene Flow," published earlier this month in Proceedings of the National Academy of Sciences. The study was featured Sept. 12 in the **The New York Times**.



Brice Noonan

"There are several variations of this species of poison dart frog, and they have different colorations," Noonan said. "Most are blue and black with bright yellow markings, but some populations of the same species have white stripes instead of yellow ones.

"That type of variation within a species is incredibly rare. It was a conundrum as to why the species was so variable."

The answer was unexpected. The yellow-marked frogs have a stronger poison than their white-striped counterparts. Their predators, chiefly birds, spot the brilliant yellow from afar and know to stay away. Yellow reads as "danger."

The white-striped frogs have a less potent toxin, which would seemingly make them more vulnerable to the same predators – but they're not.

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OXFORD, Miss. – The University of Mississippi is asking the community to help spread a little joy this holiday season by donating to the 25th annual Books and Bears program. Donations such as toys, books, dolls, bicycles and other children's play items are being accepted through Dec. 14. All donations will be collected and sorted

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Mississippi Excellence in Coaching Fellowship Aims to Build Leaders

OXFORD, Miss. – Twenty-five inaugural recipients of the Mississippi Excellence in Coaching Fellowship – a program hosted by the University of Mississippi School of Education in partnership with the Mississippi Association of Coaches and the Mississippi High School Activities Association – are expected to increase their impact on student-athletes and their communities. The coaching fellowship

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Ole Miss In the News

Clarion-Ledger: New Essay Collection Tells the Story of Meredith's Enrollment

Essays celebrate 60th anniversary of James Meredith's enrollment at University of Mississippi By Lauren Rhoades Oct. 1 marks the 60th anniversary of James Meredith's 1962 enrollment at the University of Mississippi as the school's first African-American student.

"These frogs live close to the bold and ostentatious yellow frogs, but not among them – about five miles away," Noonan said. "But they are harder to detect and far less recognizable to birds.

"Birds are more afraid of something they've never seen than something that they've tried that has toxins. So, they stay away."

Noonan's research, funded by the Centre National de la Recherche Scientifique in France, was a collaboration with a nine-member international team that was led by one of his former students, J.P. Lawrence. A postdoctoral researcher at the University of California at Irvine, **Lawrence served as lead author on the PNAS article**.

"The exciting research reported in this paper by Dr. Noonan and his student, Dr. Lawrence, demonstrates the power of international collaborations and the high quality of scientific work performed at the University of Mississippi," said Gregg Roman, professor and chair of biology.

Noonan is dedicated to mentoring not only graduate students but also undergraduates. He teaches a section of UM's introductory biology class as well as upper-level courses. During the upcoming winter session, he will teach a **course** in the Caribbean for Ole Miss students.

"I've loved reptiles and amphibians since I was a little kid," he said. "Then, when I was at a community college in south Florida, I discovered scientific journal articles, which changed my life."

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"James Meredith: Breaking the Barrier," a collection of essays edited by UM professor of journalism Kathleen Wickham, honors this historic milestone with

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