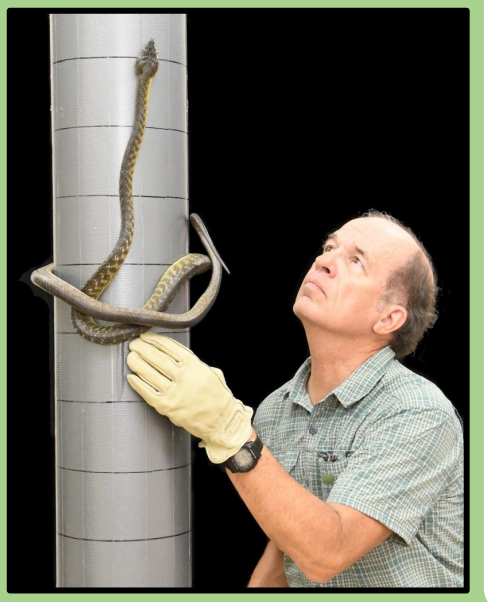
Quantitative
Eco/evo/etho
Discussions

What defines different locomotor behaviors of snakes?

Wednesday, Feb 10th
2:00 pm - 3:00 pm ET

Bruce Jayne



A fundamental problem for behavioral studies — and particularly for characterizing vertebrate locomotion — is defining what a distinct behavior is. For several decades, different types of snake locomotion have been categorized as one of four major modes: rectilinear, lateral undulation, sidewinding and concertina. However, ongoing empirical work suggests that the scheme of four modes of snake locomotion is too conservative and obscures many important functional differences. For example, electromyographic studies have repeatedly found superficially similar types of snake locomotion with differences in neural control that make them distinct. Furthermore, studies simulating some of the three-dimensional complexity found in natural environments have also revealed increasingly greater diversity of locomotor behaviors. Partly as a result of different motor patterns, I propose recognizing five and four distinct types of lateral undulation and concertina, respectively. A newly described type of climbing (lasso locomotion) is also distinct from all of these previous modes and categories, resulting in a total of twelve distinct gaits rather than four.

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Bruce Jayne is a professor of Biological Sciences at the University of Cincinatti, with a PhD in Zoology from Michigan State University and prior work at the University of California, Irvine, and the Field Museum of Natural History in Chicago, IL. He is interested in using comparative, functional and experimental approaches to understand the evolution of complex systems that involve a combination of behavior, physiology and morphology. Most of Prof. Jayne's research has focused on different aspects of locomotion and muscle function in snakes, fishes and lizards, using quantitative analysis of both motion (from high-speed video images) and in vivo patterns of muscle activity (from electromyography). He has also conducted field studies of reptiles around the world, and mentored numerous postdoctoral, graduate, and undergraduate students. More information on his research and publications can be found here.

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