UNIVERSITY OF CALIFORNIA MERCED | School of Natural Sciences

Quantitative & Systems Biology Ph.D. Dissertation Defense

Candidate: Taran Rallings

On The Size of Spherical Cows: How Body Mass Influences the Existence and Coexistence of Mammalian Herbivores

Date:

October 28, 2022

Time:

9:00 AM – 10:00 AM

Link:

https://ucmerced.zoom.us/j/84165538431

Abstract:

The fundamental constraints governing the flow of energy through consumer-resource systems ultimately determines the structure and dynamics of food webs. As this is true generally, it is also true for plant-herbivore systems, where herbivores must compete with each other to obtain sufficient caloric return. Because diverse herbivore communities are composed of species spanning a large range in body sizes, the different life histories imposed by these body sizes, the different effects of mortalities upon them, and the different effects these species have on their resources interact in complex ways, perhaps playing a role in determining the conditions for coexistence. This work describes a complex of ways in which herbivore body size governs the existence and coexistence of populations over three scales of inquiry: pair-wise consumer resource dynamics, adaptive food-webs, and food-webs in environmental and historical contexts. This provides insight into the dangerous interplay of human hunting and predator-prey dynamics for large herbivores, the persistent competitive advantages of body size, and the mystery of the missing medium mammals.

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