

Biology Seminar

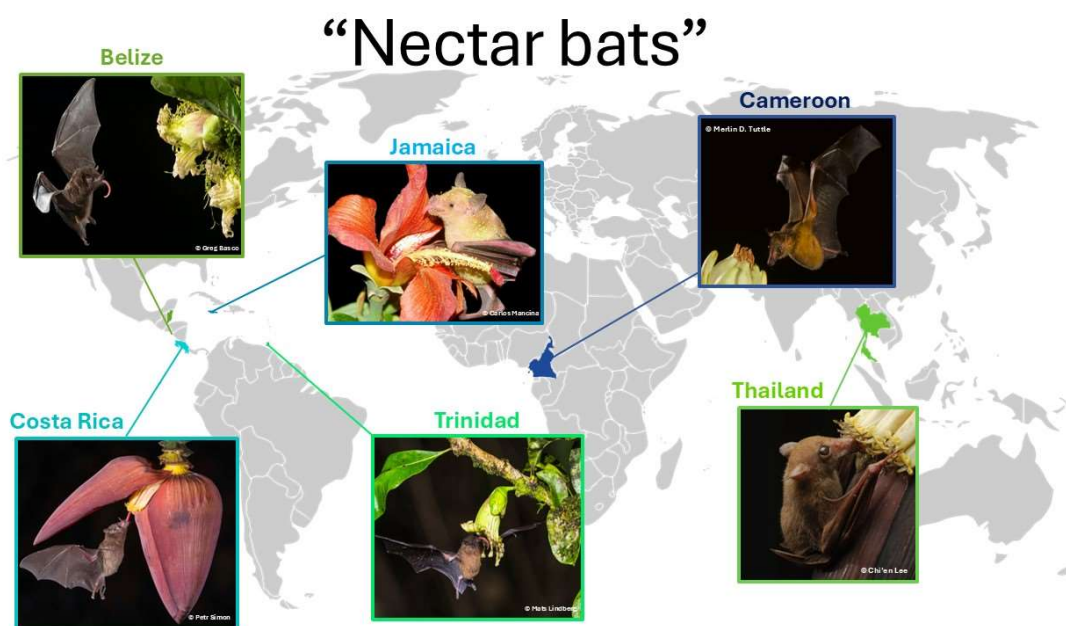
Speaker: Ken Welch, Ph.D.

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Glucose, fructose, and the evolution of high-sugar diets in bats

Monday Nov. 18 2024 | 12:00 PM PST | HCK 132



Bats have diversified to specialize on a remarkable variety of diets. Among these, sugar-rich fruit and nectar diets come with unique challenges, particularly to the maintenance of blood sugar levels and energy homeostasis, with high-sugar intake leading to disease in most mammals. Importantly, frugivory and nectarivory have independently evolved at least two, and 7 times, respectively, among bats, implying independent suites of adaptations to these dietary-related challenges. We used respirometry, stable isotope breath tracking, and metabolomics to quantify patterns of oxidation of exogenous glucose and fructose in bats spanning each of these independent evolutions of high-sugar diets. Using a multi-peak OU modelling approach, we found evidence of convergence to the evolutionary optima in both fructose and glucose from disparately related species. Additionally, the optima for frugivory and nectarivory were distinct for both glucose metabolism and fructose metabolism, providing the first quantitative evidence that different metabolic adaptations are required in mammals to specialize on frugivory versus nectarivory.

Seminar Speaker Host: Alejo Rico-Guevara

