MS Thesis
Department of Environmental Science and Policy
College of Science
George Mason University

Candidate: George Hansbrough
Defense Date and Time: October 24, 2023
Defense Location: Virtual
Title: Drivers of geophagy of the lowland tapir (Tapirus terrestris) at Amazonian interior forest mineral licks

Thesis Director: Dr. Michael Gilmore
Committee: Dr. Brian Griffiths, Dr. Diego Valderrama

ABSTRACT

The Amazon rainforest is an ecosystem dependent upon the continued function of countless physical and biological factors. The vast biodiversity within the region helps to fulfill the numerous roles required for resilience and sustainability, with many interdependent relationships woven throughout the forest. Mineral licks are sites where a diverse range of mammals and birds consume soil for dietary benefits, known as geophagy. Given the reputation of mineral deficiency in Amazonian soils, essential nutrients are often lacking in abundance elsewhere in the forest, marking mineral licks as keystone locations for the health of many species. Lowland tapir (Tapirus terrestris), are known to be frequent visitors of these sites, however, how mineral licks factor into their habitat navigation and dietary dependencies remains poorly understood. Much like mineral licks, tapir fill critical roles in the Amazon, acting as both keystone species and ecosystem engineers, contributing to the resilience and diversity of the rainforest. This study analyzed the drivers for geophagy of the lowland tapir at Amazonian interior forest mineral licks. Soil samples were collected from 83 mineral licks, 52 of which are coupled with camera trap data, to determine tapir visitation frequency and which nutrients those licks hold. A mixed-effects modeling approach was used to test potential hypotheses for tapir geophagy, including mineral supplementation, toxin adsorption, and habitat selection. Results showed support for all three hypotheses with an increase in visitation found with elevated levels of clay content %, Na, Cu, P, as well as landscape covariates such as increased elevation. Furthering understanding of critical rainforest components, such as tapir and mineral licks, aids in the ability to conduct proper ecosystem-based management practices. These practices will contribute to the longevity of the rainforest's biodiversity and role in stabilizing the earth’s climate.