Internship Focus: Species boundaries among lesser treeshrews (Scandentia, Tupaiidae) from Southeast Asia

Collaborating Institutions:

- Yale Peabody Museum of Natural History (YPM)
- U. S. National Museum of Natural History, Smithsonian Institution (USNM-SI)

Advisors:

- Dr. Eric Sargis, Professor of Anthropology, Curator of Mammalogy, YPM
- Dr. Neal Woodman, Research Biologist at USGS, Research Associate in Vertebrate Zoology, USNM-SI

Description:

Undergraduates are invited to participate in museum research during the summer of 2019 (8 weeks) to work with researchers from the Yale Peabody Museum of Natural History (YPM) in New Haven, CT, and the U.S. National Museum of Natural History, Smithsonian Institution (USNM) in Washington, DC. This project focuses on the lesser treeshrew (Tupaia minor) from the Malay Peninsula, Borneo, Sumatra, and several smaller islands in the Malay Archipelago. Tupaia minor has a complicated taxonomic history, with five subspecies currently recognized within this species. Previous studies have focused on pelage variation, but T. minor has never been analyzed with a modern, integrative approach that synthesizes morphometric and molecular data. Hence, the recognized subspecific variation may, in some cases, represent species-level diversity that would have conservation implications for this poorly studied taxon. This project will build on our previous study of the common treeshrew (T. glis), a species complex in which we recognized four additional species based on our morphometric and molecular analyses. Here we will address questions such as: 1) Does T. minor include multiple lineages that should be recognized as distinct species? 2) How did biogeographic variables affect the divergence of populations in this taxon?

The undergraduate researcher will be involved in multiple aspects of this project. At the USNM, the intern will learn how to x-ray museum study skins and measure taxonomically informative features of hand morphology from the x-rays. At the YPM, the student will georeference and map specimen localities and learn how to statistically analyze the morphometric dataset. Hence, the intern will have the opportunity to learn georeferencing and scanning techniques as well as methods of morphometric data collection and analysis. This project could lead to an expanded senior thesis project, a professional presentation at the annual meeting of the American Society of Mammalogists (ASM), a peer-reviewed publication in a zoological journal, and an IUCN Red List conservation status reassessment and/or several additional species assessments.

Learning Objectives:

Over the course of eight weeks, the student will learn to:
Conduct collections-based scientific research focused on the largely unstudied *Tupaia minor*;
- Georeference and map specimen localities;
- X-ray museum study skins;
- Measure taxonomically informative features of hand morphology from the x-rays;
- Statistically analyze the completed dataset; and
- Present the findings in a professional presentation and/or peer-reviewed publication.

**Length:** 8 weeks in the summer

**Stipend:** $5,500