

Master's Thesis Opportunity: Trophic Ecology and Conservation of Galápagos Land Iguanas

Topic: *Diet composition and interspecific competition between two Galápagos land iguanas.*



Background

The Galápagos pink land iguana (*Conolophus marthae*, the “pink iguana”) is a critically endangered reptile, restricted exclusively to the slopes of Wolf Volcano on Isabela Island, Galápagos. In this narrow range, the species occurs in syntopy with the Galápagos common land iguana (*C. subcristatus*, the “yellow iguana”). Given the critical conservation status of *C. marthae*, understanding its ecological requirements and its interactions with congeneric species is crucial for its long-term survival.

Current hypotheses suggest that interspecific competition for food resources might be a limiting factor for the distribution and abundance of the pink iguana. While previous studies have suggested some level of partitioning in the trophic niches of the two species, a high-resolution description of the actual diet composition is still lacking. To bridge this gap, a direct morphological analysis of dietary items is required to identify the key resources for the pink iguana and quantify the degree of trophic competition with the yellow iguana.

Objectives

The main goal of this thesis is to characterize and compare the diet of the two species through the morphological analysis of fecal samples.

Specific objectives include:

- a) Identifying and quantifying undigested plant components (seeds, fruits, fibers) in fecal samples of both species.
- b) Assessing the degree of dietary overlap and identifying specific food items that may be subject to competition.
- c) Comparing the results of the adopted methodology (*i.e.*, the morphological approach) with the available outcomes of metagenomic approaches.
- d) The provision of essential ecological data to inform and optimize the conservation strategies outlined in the IUCN Conservation Action and Management Plan for the species, ensuring a solid scientific basis for its long-term survival.

Methodology

The student will adopt a traditional microscopy-based morphological approach:

- Sample processing: fecal samples will be dried and weighed to ensure standardized analysis.
- Identification: systematic inspection of fecal samples to isolate botanical macro-remains. Taxonomic identification will be performed using the Charles Darwin Foundation's (CDF) reference archive (Galápagos).
- Statistical analysis: multivariate analyses will be performed to compare diet compositions.

Expected Outcomes

1. The first detailed taxonomic inventory of the diet of the pink iguana.
2. A quantitative assessment of the trophic competition between the two species.
3. The evaluation of two non-invasive approaches for studying diet composition.

Candidate Profile

We are looking for a highly motivated master's student with a background in Ecology, Zoology, or Conservation Biology. Basic knowledge of R environment is preferred, but not mandatory. Patience and attention to detail are crucial, as morphological analysis of scats is time-intensive but highly rewarding.

Additional Information

Duration: approx. 6 months.

Location: Laboratory of Zoology, Via Cracovia, 1, Dept. of Biology, University of Rome Tor Vergata.

Supervisor: Prof. Gabriele Gentile.

Co-supervisor: Dr. Lorenzo Garizio.

Interested candidates are invited to send a short motivation letter to:

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