MS Thesis Defense

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Title: Investigating Trophic Linkages For A Neotropical Migratory Bird: Molecular Identification Of Food Items And Validation Of A Protocol For Molecular Studies Of Avian Diets

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ABSTRACT

This thesis describes and validates a molecular method and its use for identifying food items in the diet of an omnivorous Neotropical migratory bird, the wood thrush (*Hylocichla mustelina*). Ecological understanding of niche, trophic interactions and the linkages in food webs are limited by difficulties in making accurate and efficient field observations of foraging behaviors and food choices to describe the diets of individual species within an ecosystem. To investigate the use of new methods to inform such ecological topics, a protocol based on DNA barcoding and Next Generation Sequencing was developed to utilize field collected scat samples to identify components of the wood thrush's diet and to quantify diet diversity in temperate forests during the wood thrush's breeding season. Comparisons of DNA sequences from diet items generated from scats were compared to concurrently collected stomach contents from the same individuals, as a primary means of validating the method to quantify that genetic information is indeed lost during digestion. To further test the efficacy of this molecular method, a secondary validation step compared molecular results from both stomach and scat samples to results obtained by a visual inspection of the same samples, where diet information was accessed by morphology to identify partially digested arthropod remains. These tests showed DNA barcoding of prey communities can provide a wealth of information on avian diet, and the use of additional markers provides an added benefit of detecting more unique information. However, species presence and absence information should be interpreted with caution since some species detected in samples with traditional morphological methods produced false negatives with molecular techniques.