DNA Analysis and Behavioral Studies of the Palpigrade *Prokoenenia wheeleri*

Report of research conducted by Kilgore College and the University of Michigan at the Travis County Parks System

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INTRODUCTION

The purpose of this project is to collect specimens of the palpigrade *Prokoenenia wheeleri* for nucleic acid (DNA and RNA) molecular analysis and behavioral studies. The Order Palpigradi is one of the least understood of the arachnid groups. No nucleic acid analysis of the genus *Prokoenenia* has been carried out due to the limited distribution of the group. Behavioral studies of the group are even more arduous due to the difficulty collecting and maintaining populations of palpigrades in a laboratory setting. Behavior such as feeding and reproduction are unknown in the group. In the spring, summer and fall of 2009 specimens of *Prokoenia wheeleri* were collected from Cypress Creek Park and Mansfield Dam Park. Collections were made approximately once a month with specimens collected varying based on the amount of rainfall, soil moisture, and soil temperature.

METHODS

Approximately once a month, beginning in April, specimens were collected from Cypress Creek and Mansfield Dam parks. Specimens were collected by turning rocks in moist areas of the parks. An average of ten specimens were taken with each collection. Fifteen specimens were preserved in 80% ethyl alcohol, frozen and shipped to Dr. Klimov at the University of Michigan. These specimens were frozen and will have their DNA analyzed in 2010 as grant monies become available. All palpigrades collected, other than those sent to Dr. Klimov, were observed for feeding behavior or used for gut analysis study. Palpigrades collected were placed in containers with a plaster of paris and a powdered charcoal bottom. Soil from the collection site was added and observations were made to analyze feeding and reproductive behavior. Palpigrades not used for behavior studies were sacrificed for gut analysis studies. Dr. Tom DeLaney and I extracted gut contents and examined the contents using microscopes. Additional gut

contents were placed on sterile nutrient agar plates and allowed to grow cultures for analysis. Dr. Tom Delaney is a microbiology instructor with expertise in this area.

RESULTS

Specimens sent to Dr. Klimov arrived in excellent condition, with nucleic acid analysis planned for 2010. Specimens reared in captivity have been kept alive for periods up to four weeks. This is about twice the time that they can be normally kept alive. Food items such as mold recovered from gut analysis and grown in culture, detritus from soil, and nematodes have been offered as food items. Even though specimens have been kept for up to a month, no obvious feeding behavior has been observed. Due to the decreasing soil temperatures in winter, collecting palpigrades has become difficult. In 2010, we intend to collect specimens and offer captive specimens in different containers one of the food items and determine which is preferred. Once this has been determined then other behavioral studies will be possible.

Table 1. Travis County's BCP sites used for collections of the palpigrade *Prokoenia wheeleri*, April-November 2009

Property Name	Collection Date	Specimens Collected
Cypress Creek Park	4-24	18 specimens
Mansfield Dam Park	6-12	5 specimens
Cypress Creek Park	6-12	5 specimens
Cypress Creek Park	9-19	10 specimens
Cypress Creek Park	11-7	10 specimens
Mansfield Dam Park	11-7	10 specimens
Cypress Creek Park	11-25	5 specimens
Mansfield Dam Park	11-25	0 specimens
		Total 63 specimens

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