INDIVIDUAL STUDY PLAN
The Botany of Plant Fungal Endophytes (BIOL 497)
Fall 1996
Student: Monica Haycox
Instructor: Roger Ruess, Biology and Wildlife

A. Course Description

This independent study will emphasize the botany and physiological ecology of plant fungal endophytes, with particular attention to the distribution of fungal endophytes among gramminoid species from the Yukon Kuskokwim River Delta. Despite the recent appreciation for fungal endophytes in the grazing ecology of domestic and wild herbivores in temperate grasslands, no research has ever been conducted on fungal endophyte infection in arctic or sub-arctic plants. This project will study the effects of landscape position, environmental influences, and grazing on fungal endophyte botany and ecology from coastal salt-marsh ecosystems of western Alaska. The major focus will be techniques and laboratory methods in fungal endophyte characterization.

B. Specific Activities

The student and instructor will meet three times each week to discuss assigned readings from current literature in fungal endophyte ecology and grazing ecosystem ecology. The student will develop techniques for staining and microscopic determination of fungal endophytes. This will be aided by expertise and reference samples obtained from the instructor’s colleagues. Over the past several years, the instructor and his graduate students have collected hundreds of samples from landscapes throughout the coastal saltmarsh region of western and south-western Alaska, including samples from various experimental treatment plots where abiotic conditions (salinity, air temperature, soil temperature, soil nutrient status, etc) and herbivory (exclosed vs control plots) have been manipulated. In addition, we will request samples from the UAF Herbarium where particular taxonomic or regional gaps in our data set exist. Establishing the distribution of fungal endophyte infection across these landscapes has enormous implications for grazing ecosystem ecology and waterfowl management.

C. Sources of Information

Weekly readings will come from (1) the instructor’s lecture notes from his graduate course, as mentioned above, and (2) articles in current research journals. Methodologies for microscopic identification of fungal endophyte infection will come from the instructor's colleagues, who have been working in this area of research.

D. Evaluation

The student's performance will be evaluated through (1) weekly assignments turned in to the instructor, (2) the instructor's assessment of student's performance during discussion and laboratory sessions, and (3) a final paper summarizing results of the laboratory research. It is expected, although not required, that the student and instructor work together and publish this work in a major scientific journal.