

Project Title: Ecological Genetic and Molecular Genetic Evidence of Allochronic Speciation in a Specialized Insect Herbivore

Investigator: Ott, James

Department: Biology

Project summary: The research conducted focused on a specialized gall-forming insect that feeds and develops on Live Oak trees. This species exhibits asynchronous broods. We sought to determine whether asynchronous offspring production represents evidence of incipient or realized sympatric speciation. Two lines of research were explored. **Study #1:** Here we sought to test for allochronic isolation by determining whether the timing of emergence of asexual *B. treatae* from leaf galls is controlled by the insect's genome, the host plant, or both. A total of 35 trees located at 8 sites across the hill country were selected and galls were collected weekly throughout the year and emergence phenologies monitored. Collection date had no apparent effect on emergence of insect (i.e. collecting/disturbing the insects in galls did not cause them to emerge earlier in the lab). Trees previously documented to be early brood trees showed evidence of having shifted to late brood trees. These results suggest that emergence timing is controlled by the plant phenotype. **Study #2.** Here we tested for allochronic isolation in patterns of neutral genetic variation as different emergence times might result in a reduction of gene flow between the two broods of the gall wasp. Cytochrome oxidase I in the mitochondrial DNA was used to measure genetic variation. Preliminary tests on both male and female wasps showed that the COI gene could be isolated using AFLP-PCR. The restriction enzyme *EcoRI* and *MseI* primers were used with the marker M-C-A-G-A. We are currently still sampling/analyzing natural populations using this marker.