# BAT AVOIDANCE IN THE KATYDID GENUS *NEOCONOCEPHALUS*

Mary K. Kilmer

Dr. Johannes Schul, Thesis Supervisor

## ABSTRACT

The hearing system of the katydid genus *Neoconocephalus* has two functions: intraspecific communication and predator (bat) avoidance. Male calls and bat cries differ spectrally and temporally. Katydids must recognize and discriminate between signal types. We categorized bat avoidance behaviors and examined temporal and spectral recognition of bat cries behaviorally during tethered flight in several species of *Neoconocephalus*.

Four bat avoidance behaviors were detected in *Neoconocephalus* katydids; steering, wingbeat interruption, dives and leg kicks. The first three behaviors were amplitude dependent, elicited by a single ultrasound pulse while the fourth was pulse-rate dependent. Steering and leg kicks were performed consistently in all species but wingstop (wingbeat interruption or dive) occurred significantly less often in *N. robustus, N. bivocatus* and *N. exciliscanorus,* all larger species.

Single pulse experiments showed that katydids respond best to pulses with relatively short rise times and a minimum duration. Spectral experiments showed that both *N. exciliscanorus* and *N. bivocatus* were relatively insensitive to higher frequencies (>30 kHz) while *N. robustus*, *N. retusus* and *N. ensiger* were sensitive. Among these three species, spectral selectivity differed, with *N. ensiger* being very insensitive at 13 kHz while *N. retusus* and *N. robustus* remained sensitive. We discuss how differences in body size, habitat and call type might account for the differences in bat avoidance.