

Eduardo Favela July 29th, 2021

The Relationship Between Flight and Call Behavior in *Neoconocephalus Tettigoniidae*

In katydids (Insecta: Tettigoniidae), males produce species specific calls that attract conspecific females for mating. These calls are highly diverse among the species of this group. The Schul Lab studies the evolution of this diversity at the behavioral, neural, and genetic level. As sound is produced with the forewings, I study the relationship between call and flight central pattern generators (CPGs). Flight behavior can be induced by tethering katydids in an airstream without their feet touching the ground. Remarkably, about 1/3 of males produced some sound before flight wingbeats started. These sounds had the same spectrum as normal calls, indicating that they were produced by the same structures as normal calls, but they had a different temporal pattern. To distinguish whether these sounds are (1) produced incidentally during wing opening at the beginning of flight, or (2) through activation of the call pattern generator, I compare the muscle activity during these sounds to that during flight and normal calling. Katydids use fore- and hindwings during flight but move only the forewings during calling. I have established a setup to record electro-myogram (EMG) data from wing muscles in the 2nd (fore wings) and 3rd (hind wings) during tethered flight. To date, I could characterize the typical EMG pattern at the beginning of tethered flight. Currently, I am working with a species with high likelihood to call at the beginning of flight. After completion of these experiments, I plan to measure the effects of lesions of the thoracic central nervous system on flight and compare them to effects on calling. This project will inform our understanding of the evolution of calling behavior of katydids, in the presence of the much older flight behavior.