

UNC Curriculum in Ecology presents

Andrew Stephenson

Interrelationships among inbreeding, herbivory and disease dynamics in a wild gourd.

Thursday Feb. 21
2:30PM
Coker 201



Abstract:

Over the past six years we have examined the effects of inbreeding on herbivory and the incidence of diseases vectored by herbivores in a wild gourd, *Cucurbita pepo* ssp *texana*. These studies have revealed that there is additive genetic variation for resistance and tolerance for herbivory by cucumber beetles among the families in our population and that resistance and tolerance varies with ontogeny. We have also found that inbred plants harbor larger populations of aphids and have higher levels of damage by cucumber beetles than outbred plants. Not surprisingly, the inbred plants have higher levels of mosaic viral diseases vectored by aphids than outbred plants. Contrary to our expectations, the outbred plants have a higher incidence of bacterial wilt disease whose pathogen (*Erwinia tracheiphila*) is vectored by the cucumber beetles. Our preliminary data suggest that the higher levels of wilt disease in the outbred plants is due to the aggregation of cucumber beetles in the flowers during mating: the outbred plants produce more of the volatile organic compounds that attract the beetles to the flowers than inbred plants...the beetles defecate onto the nectaries...and *Erwinia* in the fecal pellets enter the vascular system of the plant via the nectaries. The nectar of the wild gourd contains antibiotic properties but the *Erwinia* are relatively unaffected by the nectar antibiotics compared to *E. coli* and yeast. The flowers of viral infected plants produce fewer of the volatile organic compounds that attract the cucumber beetles than healthy plants and, consequently, plants with mosaic viral diseases have a lower incidence of wilt disease than would be expected by chance alone. Finally, wild gourds with a transgene conferring resistance to the viral diseases are significantly more likely to contract wilt disease than virus susceptible wild gourd plants.

To meet with Andrew on Feb. 21 please email Miranda Welsh: mwelsh@unc.edu