

## Prevalence of Bacterial Pathogens in Ixodid Ticks in Chatham County, NC - Charlie Apperson

- 1) Tick bites occasionally result in the transmission of pathogens
  - a) 60% are zoonoses
  - b) Just and FYI - 80% of pathogens with a high potential for bioterrorism are zoonotic
- 2) Ticks require a bloodmeal to complete their life cycle
- 3) Common ticks of NC
  - a) American dog tick - *Dermacentor variabilis*
  - b) Brown dog tick - *Rhipicephalus sanguineus*
  - c) Dark-legged (deer) tick - *Ixodes scapularis*
  - d) Lone star tick - *Amblyomma americanum*
- 4) Tick-borne diseases
  - a) Lyme Disease
  - b) Spotted fever rickettsioses, including RMSF
  - c) *Ehrlichia chaffeensis* infection, formerly HME
  - d) *Anaplasmosis phagocytophilum* infection, formerly HGA
- 5) Deer are important in the tick life cycle
- 6) Some specifics
  - a) Lyme disease
    - i) Distribution does not match up with the distribution of the vector
    - ii) Disease associated with feeding of nymphal stage
    - iii) *Peromyscus* mice, as well as some other small rodents, important reservoirs
    - iv) Black-legged ticks
      - (1) 2-year cycle
      - (2) Nymphs feed prior to larvae and infect rodents
    - v) Case rates lower as you go south
      - (1) Ticks feed on lizards
      - (2) Dead end host for the spirochete
      - (3) Breaks transmission cycle
  - b) RMSF (<http://www.cdc.gov/mmwr/PDF/rr/rr5504.pdf>)
    - i) 2 primary vectors - geographic differences, east to west
    - ii) Pathogen - *Rickettsia rickettsia*
    - iii) Wide variety of *Rickettsia* spp cause similar diseases
    - iv) Increasing incidence of cases in NC - 10 fold increase since 2000
    - v) >95% of cases are not laboratory confirmed
      - (1) Collaborative eco-epidemiological study
      - (2) Looking for true disease burden
- 7) Enhanced surveillance study (RMSF)
  - a) Disease data collection
    - i) Chatham County NC outpatient clinics
    - ii) 4 physician practices from area
  - b) Case classification (<http://health.state.ga.us/pdfs/epi/gers/Mar08GER.pdf>)
    - i) Probable
    - ii) Confirmed
  - c) Tick surveys

- i) Primarily collected lone star ticks
  - ii) Also collected American dog ticks and deer ticks
  - iii) Found a high number of ticks containing rickettsial species (at 44% of sites)
  - iv) Some other pathogens reported as well
  - v) Results
    - (1) Negative correlation between infection in ticks of *R amblyommii* and other rickettsial species
    - (2) 6 of 15 *Ixodes scapularis* nymphs were infected with *Borrelia burgdorferi*
  - d) *R amblyommii* may be the problem pathogen and not *R rickettsia*
- 8) A lot of questions generated from this study