Further evidence of *Borrelia burgdorferi* sensu stricto associated with Lyme disease in the South

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Questing black-legged ticks (*I. scapularis*) associated with Lyme disease (LD) were collected at several locations on the Outer Banks of North Carolina between 1991 and 2009. The authors found that in October 1991, *Borrelia burgdorferi*-infected *I. scapularis* ticks were detected at 50% of the sites (four of the eight). “The spirochetes were consistently detected in questing adult ticks at the site in collections made during an 18-year period,” explains Levine, from the College of Veterinary Medicine, North Carolina State University. [2]

The North Carolina investigators went to great lengths to verify the identity of *B. burgdorferi* sensu stricto cases. “The 16 isolates that we sequenced had 98–99% homology with *B. burgdorferi* sensu stricto,” states Levine. *B. burgdorferi* sensu stricto was isolated from rodents including rice rats (*Oryzomys palustris*), white-footed mice (*Peromyscus leucopus*), and marsh rabbits (*Sylvilagus palustris*).

In their article entitled "Stable Transmission of *Borrelia burgdorferi* Sensu Stricto on the Outer Banks of North Carolina," investigators described both northern/Midwestern and southern *I. scapularis* haplotypes. (A haplotype is a group of genes within an organism that was inherited together from a single parent.) One group of haplotypes has been associated with antibiotic-refractory Lyme arthritis. [3]

Levine and colleagues also identified three strains, B31, JD1 and M11p, using advanced sequencing technology. The *Borrelia burgdorferi* sensu stricto has been shown to predict the capacity for hematogenous dissemination during early LD. [4]

The investigators warn readers of the importance of knowing there are *Borrelia burgdorferi*-infected *I. scapularis* ticks in the south. The authors point out that “a path through the sanctuary is a routine route for recreational walking, jogging and bird viewing; both are activities that pose a potential risk of seasonal human exposure to *B. burgdorferi*-infected questing ticks.” [2]

Other studies have reported *B. burgdorferi* sensu stricto in the Southeastern USA, as well, with more than 12 genospecies identified, explains Levine. In his review of three papers, [5-7] he points out “Oliver et al. [8] have also documented the role that other species of ticks and hosts may play in the maintenance of *B. burgdorferi* transmission, as well as other genospecies of *Borrelia* in the Southeast.”

As Rudenko and colleagues point out, the Carolina Wren bird has the potential to move these ticks throughout the south. Rudenko identified “genetically diverse strains of *Borrelia* in individual *I. minor* [a tick species] that fed on a single Carolina Wren (*Thryothorus ludovicianus*).”[9]

Levine and colleagues are to be congratulated on a well-designed study indicating that *Borrelia*
Borrelia burgdorferi sensu stricto is endemic in questing I. scapularis and mammalian tick hosts in the southeastern USA.

References: