WEST NILE VIRUS INFECTION RATES OF CULEX TARSALIS AND THE RATIOS OF AEDES VEXANS TO CULEX TARSALIS DURING MULTIPLE YEARS AT MULTIPLE TRAPPING SITES IN SOUTH DAKOTA

Colin E. Brown, Matt J. Wittry and Michael B. Hildreth
Departments of Biology/Microbiology and Veterinary Science
South Dakota State University
Brookings, SD 57007

Rachel A. Hoffman and Christopher D. Carlson
South Dakota Public Health Laboratory
Pierre, SD

ABSTRACT

Since 2003, West Nile Virus (WNV) has been a major health concern for South Dakotans. The main vector for WNV in the state is Culex tarsalis. This vector mosquito and the nuisance mosquito, Aedes vexans, are the major two mosquito species feeding on humans throughout this region. Aedes vexans rarely transmits WNV, but moderate populations of this nuisance species elicit avoidance behaviors in people (e.g. going indoors, wearing mosquito repellants) that might also limit the exposure of these individuals to WNV from the vector mosquito. This study compared Ae. vexans and Cx. tarsalis populations in three ecogeographic regions of South Dakota (Brookings, Huron, and Pierre) over a four-year period (2003 to 2006). Mosquitoes were collected using CDC miniature light traps baited with carbon dioxide so that they could also be tested for WNV using an RNA III Isolation Kit and RT-PCR procedures. During the four-year span, 92.5% (245 out of 265) of the positive pools throughout the state were observed during a transmission period which ran from July 8th to August 31st. During the pre-transmission period (June 1-July 7), there was great variability in mosquito numbers each year and site (ranging from 958.9 Ae. vexans /day during the wet year of 2004 in Brookings to 2.8/day during the drought year of 2006 in Brookings); in most cases, the ratio of Ae. vexans to Cx. tarsalis mosquitoes was greater than 5:1. During the transmission period, the mean number of mosquitoes/day generally ranged between 100 and 400, and there was an increased percentage Cx. tarsalis. The Huron and Pierre sites generally had a higher percentage of Cx. tarsalis than Brookings.