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CHAPTER 5

# WEST NILE VIRUS IN THE PERMANENT-RESIDENT BIRD COMMUNITY OF A FRAGMENTED OHIO LANDSCAPE

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Abstract.—We surveyed the permanent-resident bird community of a fragmented Ohio landscape for West Nile virus (WNV) antibodies to determine which species carried antibodies, what percentage of the individuals in each species carried antibodies, and whether antibodies were retained from one year to the next. Eight of 20 species carried antibodies in at least one year. For species with >10 captures, the seroprevalence ranged from <1% in Downy Woodpeckers (*Picoides pubescens*) to 33% in Northern Cardinals (*Cardinalis cardinalis*). About 10 young-of-the-year were seropositive each year, which indicates the presence of active viral transmission in the preceding summer. All four seropositive birds from year one that were recaptured in year two were seropositive again, indicating that in at least two species, antibodies may persist. These results suggest that permanent-resident birds are either largely unaffected by WNV or are generally susceptible to mortality when infected with it. The exception is the Northern Cardinal, which may be an important reservoir species for the virus. Seroprevalence in Northern Cardinals was high in both years, and females had higher seroprevalence than males. *Received 30 April 2005, accepted 23 November 2005.*

Resumen.—Estudiamos una comunidad permanentes de aves residentes en una región fragmentada del estado de Ohio para detectar cuales especies de aves eran portadoras de anticuerpos del virus del Oeste del Nilo (VON), así como determinar que porcentaje de individuos en cada especies eran portadores de anticuerpos y si estos anticuerpos eran conservados de un ano al otro. De 20 especies de aves, ocho eran portadoras de anticuerpos en al menos un año. Para las especies con mas de 10 capturas, el rango de la sero-frecuencia fue de menos del 1% en *Picoides pubescens* hasta 33% en *Cardinalis cardinalis*. Alrededor de 10 juveniles fueron sero-positivos cada año, lo que indica la presencia de una infección viral activa en el verano anterior. Las cuatro aves sero-positivas del año uno que fueron recapturadas en el año dos fueron sero-positivas nuevamente, indicando que en al menos dos especies, los anticuerpos pueden subsistir. Estos resultados sugieren que las aves residentes son ampliamente no afectadas por el VON o que son por lo general susceptibles a mortalidad cuando son infectadas con el virus. La excepción es *Cardinalis cardinalis*, la cual puede ser un hospedero importante para el virus. La sero-frecuencia en *Cardinalis cardinalis* fue alta en ambos años, y las hembras tuvieron una sero-frecuencia mayor que los machos.

Since West Nile virus (WNV) appeared in North America, researchers have studied its effects on several different groups of birds (Beckwith et al. 2001, Bernard et al. 2001, McLean et al. 2001, Komar et al. 2003). They have studied migrants to determine how the virus spreads (Rappole et al. 2000), summer residents to determine how and when the virus emerges, and susceptible groups like corvids to determine why some birds are so much more vulnerable to the virus than others (Steele et al. 2000). Some studies have systematically investigated the antibody status of the breeding bird population to determine which species might carry some resistance to WNV and act as a potential reservoir for the

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