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Serologic Evidence of Arboviral Infections in White-tailed Deer from Central Wisconsin

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ABSTRACT: A survey conducted during 1979–1980 on white-tailed deer (*Odocoileus virginianus*) in central Wisconsin revealed serological evidence of infection by selected arboviruses. Among sera from 41 deer, antibody was detected for Jamestown Canyon virus (56%) and Bunyamwera group virus (80%), demonstrating their continuing endemic activity. Antibody for La Crosse virus, not found previously in sera from deer in central Wisconsin, also was detected (5%) in this study.

Key words: White-tailed deer, *Odocoileus virginianus*, arbovirus, Jamestown Canyon virus, California group virus, La Crosse virus, survey.

White-tailed deer (*Odocoileus virginianus*) may act as reservoirs or links in the maintenance cycle of arboviruses of public health importance, such as Jamestown Canyon virus (JC) (Grimstad et al., 1982, 1986). The status of some arboviruses may be changing or is not well documented in parts of the Great Lakes region of North America; recent data are not available on the prevalence of arboviruses in deer from Wisconsin. The objective of this study was to document the status of arboviral infections in deer from central Wisconsin (USA). The study was conducted on the Buena Vista Marsh in southwestern Portage County, Wisconsin (44°15′ to 44°28′N, 89°30′ to 89°43′W), which encompasses about 200 km² of drained marsh and is mainly agricultural (Murphy et al., 1985). Deer inhabit the area (about 10/km²) from spring to fall and occupy nearby wooded areas in winter (Murphy et al., 1985).

Blood was collected in sterile, nonheparinized tubes from the body cavities of 47 freshly killed deer during the November 1980 hunting season, and by jugular puncture with sterile syringes from six deer live-trapped during late fall and winter, 1979–1980 (Murphy et al., 1985). Blood samples were allowed to clot at room temperature, centrifuged, and sera were collected and frozen until tested. Comparative neutralization tests (Pantuwatana et al., 1972) were used to test sera against JC, Bunyamwera group isolate 523 (BUN), La Crosse (LAC), and Trivittatus (TVT) viruses by W. Thompson (Zoonoses Research Laboratory, University of Wisconsin, Madison, Wisconsin 53706, USA); procedures and criteria were identical to those detailed in Issel et al. (1972b). Due to hemolysis or contamination, 12 sera were unsuitable for testing.

Evidence of infection by JC, BUN, and LAC viruses was demonstrated in sera collected from deer on the Buena Vista Marsh (Table 1). High serologic reactor rates were detected for BUN and JC, consistent with previous reports from central Wisconsin (Issel et al., 1970, 1972b). However, the rate for JC virus appeared lower in fawns (0.5-yr-old) than in older deer, perhaps because fawns may be protected by maternal antibody (Issel et al., 1972b; Boromisa and Grimstad, 1987). In this study, 91% of sera positive for JC also were positive for BUN. A close relationship between the distribution of BUN and JC has been proposed

TABLE 1. Percent of white-tailed deer seropositive for Jamestown Canyon (JC), Bunyamwera group isolate 523 (BUN), La Crosse (LAC) and Trivittatus (TVT) viruses in southwestern Portage County, Wisconsin, 1979–1980.

	Age group		
Virus	0.5 yr (12)[a]	>1.5 yr[b] (29)	All ages (41)
JC	25	69	56
BUN	75	83	80
LAC	0	7	5
TVT	0	0	0

[a] Number of samples tested.
[b] Deer 1.5 yr of age or older.

(Issel et al., 1972b). The importance of JC as a human disease is increasing (Grimstad et al., 1982), and human infection may be associated with areas of high deer abundance (Grimstad et al., 1986; Boromisa and Grimstad, 1987). White-tailed deer appear to be important vertebrate hosts for JC (Issel et al., 1972a; Boromisa and Grimstad, 1987).

A low reactor rate for LAC was evident (Table 1). LAC was not detected in a previous survey in central Wisconsin (Issel et al., 1972b); deer may move from an endemic area in southwestern Wisconsin (Issel et al., 1972b; Thompson et al., 1972), or LAC virus may sometimes spread outside the endemic area via transovarially infected eggs of *Aedes triseriata*. Serologic evidence of TVT was not detected in this study, but deer may be poor indicators of TVT virus activity in nature (Issel et al., 1972a); evidence of TVT might be masked by a high prevalence of antibody to JC virus (Boromisa and Grimstad, 1987).

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