VECTOR-BORNE AND ZOONOTIC DISEASES
Volume 9, Number 3, 2009
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DOI: 10.1089/vbz.2008.0128

Serological Examination of Songbirds (Passeriformes) for Mosquito-Borne Viruses Sindbis, Ťahyňa, and Batai in a South Moravian Wetland (Czech Republic)

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Abstract

A total of 178 free-living birds of 14 species of 7 families of Passeriformes sampled in a freshwater reedswamp habitat in southern Moravia in July 2006 were examined for hemagglutination-inhibiting (HI) antibodies to *Alphavirus* Sindbis (SINV), and bunyaviruses Ťahyňa (TAHV) and Batai (BATV). Hemagglutination-inhibiting antibody was detected against all three viruses, but at different frequencies: SINV 0.7%, TAHV 14.0%, and BATV 6.8%. The survey indicates circulation of mosquito-borne viruses TAHV and BATV and very low, if any, SINV activity in the area.

Key Words: *Alphavirus*; *Bunyavirus*; *Orthobunyavirus*; Mosquitoes; Serosuvey; Moravia

Introduction

Six mosquito-borne viruses have been reported to occur in Central Europe (Málková et al. 1986; Hubálek and Halouzka 1996, Weissenböck et al. 2002): Sindbis (SINV), West Nile (WNV), Usutu (USUV), Ťahyňa (TAHV), Batai (BATV; syn. Čalovo), and Lednice (LEDV). Some of these viruses occur in the Czech Republic in the region studied. South Moravia is a well-known natural focus of TAHV infection. Many abundant local culicine species, especially of the genera *Aedes* (*Ae. vexans, Ae. cinereus*) and *Ochlerotatus* (*Oc. cantans*), are vectors of Valtice fever, which is an influenza-like disease caused by TAHV occurring between June and September. Most often affected are children and other non-immune persons like tourists and anglers. This natural focus of Valtice fever has long been known and investigated, and the virus has been isolated repeatedly from vector mosquitoes (Rosický and Málková 1980). Ťahyňa virus is still present in the area, as documented by isolation of a number of strains from *Aedes vexans* and *Ae. cinereus* in 1997 and 1999 (Hubálek et al. 1998, 2000). BATV was isolated in the area by Smetana et al. (1967) from *Anopheles maculipennis* group mosquitoes. There is some indication of its pathogenic effect on humans (an influenza-like illness: Bárdoš et al. 1969) and domestic animals, but the definitive proof has not yet been presented. Other viruses isolated in this region were LEDV (Málková et al. 1972) and WNV (Hubálek et al. 1998, 2000). SINV has not yet been isolated in the Czech Republic, although antibodies have been occasionally detected at a low frequency in free-living birds in South Moravia (Hubálek et al. 1989). No human case of SINV infection has been reported in the Czech Republic.

A number of mosquito-borne viruses are associated in natural foci with birds that may serve as their hosts or a reservoir and may also play a role in their dispersal (Hubálek et al. 1989). The aim of the present study was to evaluate present activity of SINV, TAHV, and BATV in natural foci in South Moravia, using serological examination of free-living birds, and complementing a previous serosurvey of the birds for WNV (Hubálek et al. 2008).

Materials and Methods

Study site

Songbirds (Passeriformes) were caught in the fishpond Nesyt at Sedlec near Mikulov (175 m a.s.l., district of Břeclav) in southern Moravia during 15–23 July 2006. In the littoral zone of the pond Nesyt, there are wide reed belts (*Phragmites communis, Typha angustifolia, T. latifolia)*, which are a suitable habitat for both mosquitoes and several species of birds living in reedswamps. Local fauna of mosquitoes consists of at least 22 species (Minář 1973, Ryba et al. 1974; own observations): *Aedes cinereus, Ae. vexans, Ae. rossicus, Ochlerotatus cantans, Oc. cataphylla, Oc. excrucians, Oc. flavescens, Oc. dorsalis, Oc. caspius, Oc. communis, Oc. sticticus,*

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