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WEST NILE VIRUS, REPTILES, ALLIGATORS - USA (FLORIDA) (05)

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A ProMED-mail post

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From: Charlie Calisher <[calisher@cybersafe.net](mailto:calisher@cybersafe.net)>

Comment on Alligators and Viruses

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Steve Grenard, commenting in "West Nile virus, reptiles, alligators - USA (FL) (04) [20021117.5836](#)" suggested that: "Viruses that affect endothermic mammals and birds are rarely found in ectothermic reptiles. The late Dr Sherman A Minton discovered evidence for the presence of Western equine encephalitis virus in garter snakes during the summer and early fall but, after winter and hibernation, it had disappeared, indicating that the wide variation in body temperature endured by ectotherms offers an unfavorable environment for such agents."

I have never heard of the late Dr. Sherman Minton, so it comes as a surprise to me that he is dead. However, I suspect that Dr. Minton was citing the work of others, and mis-citing it as well. Leo Thomas and coworkers and others (1-2) showed that garter snakes, *Thamnophis* spp., responded to experimental infection with Western equine encephalitis virus

(WEEV) by developing viremias of long duration. The virus was dormant during winter (the colder months in Montana) but was reactivated in the spring. WEEV was transmitted from infected *Culex tarsalis* mosquitoes to garter snakes and uninfected *Culex tarsalis* mosquitoes fed on WEEV-infected garter snakes became infected (3). Gebhardt et al. isolated 37 strains of WEEV from 84 snakes of three genera in Utah (4). There were a total of 3 species of garter snakes found infected: *Thamnophis elegans*, *Th. vagrans*, and *Th. sirtalis*, a gopher snake (*Pituophis catenifer*), and a blue racer (*Coluber constrictor*). Young born to naturally infected snakes were shown to be infected.

Karstad (5) detected neutralizing antibodies to Eastern equine encephalitis virus in serum samples from 5 snakes, one turtle, and one alligator collected in the Okefenokee Swamp, Georgia. In experimentally inoculated reptiles, high-titer viremias of long duration were observed in snakes, lizards, alligators, and turtles. In 1992 studies in south Texas following the 1971 Venezuelan equine encephalitis virus epizootic there, Steve Bowen and others from CDC isolated WEEV from Texas tortoises (*Gopherus berlandieri*), which we dug out of the sand where they were hibernating.

In the same posting, Alexis Shelokov commented: "If my memory serves me right, some years ago Craighead and colleagues of the NIH/MARU lab in Panama reported evidence of frequent Eastern equine encephalitis virus infections in local alligators." The Moderator requested a reference, if anyone had one. I do not know of such a paper, but there is a reference to the occurrence of antibody to Eastern equine encephalitis virus in lizards in Panama (6). Dick Hayes and coworkers found that only 1/190 serum samples from reptiles had antibodies to Eastern equine encephalitis virus (7). However, experimentally-infected reptiles were highly susceptible to infection. They found that high-titer viremias in snakes and turtles lasted 2-3 weeks. Further, they observed that an inoculated garter snake held in an outdoor cage during the winter and 3 infected spotted turtles kept in a refrigerator still had viremia when warmed up and bled 6 months later. There are many more papers in the literature recording the isolation of various arboviruses from reptiles.

All this brings up a question: If Kunjin virus is simply another name for (actually a genotype of) West Nile virus, why have the Australians not observed die-offs in farmed crocs? Do the slight genetic differences between Kunjin virus and West Nile virus code for genes specifying significant (for crocodilians) biological differences? Or have the crocs of

Australia come into some sort of equilibrium with Kunjin virus? If so, perhaps there is hope for the wildlife of North America after all.

References:

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[see also:

West Nile virus, reptiles, alligators - USA (FL) [20021114.5797](#)

West Nile virus, reptiles, alligators - USA (FL) (02) [20021115.5815](#)

West Nile virus, reptiles, alligators - USA (FL) (03) [20021116.5820](#)  
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