

MOLECULAR CHARACTERIZATION OF A POXVIRUS ISOLATED FROM AN AMERICAN FLAMINGO (*PHOENICONAIS RUBER RUBER*)

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Study Results

An avian poxvirus was isolated from the beak scab of an American flamingo by inoculation on the chorioallantoic membrane (CAM) of specific-pathogen-free (SPF) chicken embryos. The virus produced multifocal areas of epithelial hyperplasia along with foci of inflammation in the CAM, and rare cells contained small eosinophilic intracytoplasmic bodies. Chickens inoculated in the feather follicle of the leg with the isolated virus did not develop significant lesions. Phylogenetic analysis of the predicted amino acid sequences demonstrated flamingo poxvirus (FIPV) to be more closely related to condor poxvirus (CPV) as well as canary poxvirus (CNPV) and Hawaiian goose poxvirus (HGPV) than fowl poxvirus (FPV) (Figure 1).

Significance of Study Results

Results of this study clearly indicate that FIPV isolate is genetically different from FPV, the type species of *Avipoxvirus*. The data from this study as well as findings from previous studies suggest that the existence of two distinct lineages of avipoxvirus in nature, one with REV sequence and the other without REV sequence, could be the result of complex genetic phenomenon that might be contributing to poxvirus evolution, which requires additional studies to understand.

Additional Information

Natural poxvirus infection is common in commercial poultry (chickens and turkeys), pet birds, and more than 60 species of free-living birds representing 20 families. Signs of pox viral infection are

similar across host species. Avipox infection generally manifests as either cutaneous or diphtheritic forms, occurring in some cases in the same bird. The most common cutaneous form develops as a discrete nodular proliferative skin lesions in the non-feathered parts of the body, scab formation, and desquamation of the degenerating epithelium; whereas, the diphtheritic form involves proliferative lesions in the mucous membrane of the mouth, pharynx, esophagus and trachea. CNPV often causes a concurrent systemic infection, which results in high mortality rates in canaries. In recent years, there has been an increasing concern regarding the prevalence of avipoxviruses in non-domestic birds, such as Andean CPV, canary-like viruses from Galapagos passerines, and HGPV, with genetic, antigenic and biological properties that are distinctly different from FPV.

Host specificity is an important phenomenon among some avian poxviruses, especially those that infect free-living birds. Poxvirus isolates from flicker, thrushes, psittacines, Canada goose, buzzard, mynah and starling, magpies and great tits, owl, falcon, eagle, Hawaiian crows and apapane, Hawaiian goose, and palila showed strict host specificity based upon host susceptibility and antigenic cross-protection studies using several species of free-living and domestic birds. Although, substantial work has been done on their cross-reactivity, histopathology and/or electron microscopic examination, information about genetic differences especially between poxvirus isolates containing REV sequences and isolates without REV sequences is limited.

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