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PATHOGENICITY OF NEWCASTLE DISEASE VIRUSES ISOLATED FROM WILD DUCKS AGAINST CHICKENS

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Newcastle disease viruses (NDV) are generally considered as an antigenically homologous group, in spite of the significant differences in their virulences. In the present experiments, antigenic analysis of 29 strain of NDV isolated from wild ducks at various places in Japan was performed using monoclonal antibodies against Taka virus, which is a variant of NDV, and Miyadera strain of NDV. Furthermore, six strains of the virus were inoculated into one-day-old chickens for examination of their pathogenesis.

The results obtained were follows:

1) In the hemagglutination inhibition (HI) test, the 29 strains of NDV were classified into 6 groups.

2) Six strains of the virus were examined for biological activities, including a) mean death time of embryos with the minimum lethal dose, b) intracerebral pathogenicity index for day-old chicks, c) ability of plaque formation on chicken embryo fibroblasts, d) agglutination of cattle red blood cells, e) rate of elution and f) thermostability of hemagglutinin. It was found that three strains (79N-248, B-6, B-8) belong to the velogenic type, one strain (DK/Hokkaido/14/80) belongs to the mesogenic type and the remaining two strains (DK/Hokkaido/218/80, D-28) belong to the lentogenic type.

3) All of the specific-pathogen-free (SPF) chickens inoculated with 79N-248, B-8 or B-6 strains at one day of age and most of the chikens inoculated with DK/Hokkaido/14/80 strain at the same age died of Newcastle disease (ND). Furthermore, all the direct contact control chickens which were reared in the same cages as the virus-inoculated chickens also died. By contrast, only a few of the SPF chickens inoculated with DK/Hokkaido/218/80 or D-28 strains and the SPF chickens in the direct contact control groups died from ND. Most of the surviving chickens with HI antibody to NDV withstood challenge of virulent Taka virus and acquired immunity to ND. Compared to the commercial chickens with maternal antibody to NDV, SPF chickens were more sensitive to the virus infections.