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DUCK PLAGUE IN AMERICAN ANSERIFORMES

The first reported outbreak of duck plague on the American Continent occurred in a flock of White Pekin ducks in the concentrated duck-producing area of Long Island, New York, on January 3, 1967 (Leibovitz and Hwang, Proceedings of the 39th Annual Northeastern Conference on Avian Diseases, 1967). While some members of the order Anseriformes (ducks, geese and swans) have been shown to be experimentally susceptible to duck plague (Van Dorsen and Kunst, 1955. Tijds. Diergeneesk. 80: 1286), reports of natural infection have been limited to domestic ducks (*Anas platyrhynchos domesticus*), muscovy ducks (*Cairina moschata*) (Jansen, J., 1964. Ind. Vet. J. 41: 309-316), and geese (*Anser anser domesticus*) (Jansen and Wemmenhove, 1965. Tijds. Diergeneesk. 90: 811).

In order to gain more information as to the source of infection, mode of transmission, and the spread of the disease in Anseriformes other than domestic ducks in the vicinity of the original outbreak of duck plague on Long Island, attempts were made to isolate and identify the virus from wild birds.

Virus Isolation and Identification

Swans, geese and ducks other than domestic White Pekin ducks submitted to the laboratory for diagnosis were examined for gross lesions. A piece of the liver and spleen of individual birds was taken for virus isolation. The tissues were homogenized, and antibiotics were added to the homogenate which was used as inoculum. Each inoculum was inoculated intramuscularly into newly-hatched, susceptible White Pekin ducklings, and onto the chorio-allantoic membrane of duck eggs on the 14th day of incubation. Tissue samples were considered duck plague virus positive if the inoculated ducklings and duck embryos died within 7 days postinoculation, and with mortality patterns and gross lesions characteristic of duck plague virus infection. Specimens of duck plague virus positive tissue samples were then submitted to the U. S. Department of Agriculture for confirmation.

Results

Duck plague virus was isolated from

2 of 17 cases examined (Table 1). The first positive case was a wild mute swan (*Cygnus olor*) which was found dead on January 30, 1967, in the marshes opposite the duck farm where the original duck plague outbreak took place. This bird was a mature female. Necropsy findings were head lacerations, myocardial petechial and ecchymotic hemorrhages, dark bile-stained liver, pulmonary hemorrhages, hemorrhagic enteritis, white-striped kidneys, cloacal necrosis, necrotic-hemorrhagic typhilitis, and slight decomposition. Trematodes and cestodes were found in the intestinal tract. The second case was in muscovy ducks which were received on May 25, 1967. These birds were located approximately 40 miles from the duck farm of the original duck plague outbreak. They were raised by a collector and importer of ornamental fowl. The principal gross lesions of the 4 adult birds (3 females and 1 male) were blue discolored beak, catarrhal and necrotic esophagitis, pale livers with pinpoint white spots and petechial hemorrhages, dark spleens, hemorrhagic enteritis, myocardial petechial hemorrhages, and cloacal and rectal congestion. One of the females had ruptured-yolk peritonitis. Both cases of positive virus isolation have been confirmed by the U. S. Department of Agriculture.

Discussion and Conclusions

Prior to 1967 duck plague had not been known to be present on the American Continent. It appears that the maintenance of a concentrated population of susceptible domestic ducks such as that on Long Island served as a sensitive monitoring system for the presence of the disease. The question as to how the virus reached Long Island remains to be determined.

The isolation of duck plague virus from the swan found dead near the duck farm where duck plague broke out raises the question whether this bird acquired the infection from infected ducks,

TABLE 1. Results of duck plague virus isolation.

Date	Species	In duck- lings	In duck embryos
2/1/67	Mute swan (<i>Cygnus olor</i>)	+	+
3/15/67	Mute swan (<i>Cygnus olor</i>)	—	—
5/19/67	Mute swan (<i>Cygnus olor</i>)	—	—
6/13/67	Mute swan (<i>Cygnus olor</i>)	—	—
5/25/67	Muscovy duck (<i>Cairina moschata</i>)*	+	+
2/27/67	Mallard duck (<i>Anas platyrhynchos</i>)	—	—
3/4/67	Mallard duck (<i>Anas platyrhynchos</i>)	—	—
6/14/67	Mallard duck (<i>Anas platyrhynchos</i>)	—	—
4/18/67	American (common) scoter (<i>Oidemia nigra americana</i>)	—	—
4/17/67	Falcated duck (<i>Anas falcata</i>)*	—	—
2/14/67	Black duck (<i>Anas rubripes</i>)	—	—
2/14/67	Black duck (<i>Anas rubripes</i>)	—	—
1/17/67	Canvasback (<i>Aythya valisineria</i>)	—	—
2/27/67	Greater scaup (<i>Aythya marila</i>)	—	—
3/2/67	Greater scaup (<i>Aythya marila</i>)	—	—

*Received from ornamental bird collector. All other species are wild.

or vice versa. If the swan acquired the infection from Anseriformes other than domestic ducks, then the question remains as to what species were involved and in what manner the transmission occurred. Was the virus transported from Europe to America by passage of the infection through a number of birds or by some other indirect means? Since the swan was found dead later than the first outbreak of the disease in domestic ducks, it appears more likely that the swan acquired the infection from the infected duck farm. It is possible that the presence of the infection in swans perpetuated the infection in other wild Anseriformes.

The demonstration of the infection in muscovy ducks approximately 5 months later and 40 miles away from the farm of the original disease outbreak invites speculation as to the origin of the infection. Did the muscovies acquire the infection from wild birds, or was it the result of contact with imported birds which the owner maintained on the premises?

In the limited observations presented

here, there were no pathognomonic lesions of the disease. While some of the lesions were suggestive of duck plague, diagnosis was established by means of virus isolation. Perhaps examination of a greater number of infected birds would reveal individuals with more pronounced lesions.

Continued surveillance for the presence of this infection in wild Anseriformes is essential. While duck plague has been characterized as an acute disease, chronic or latent infection in certain species of birds should be considered possible. Because of the potential menace, it is important to define the relative susceptibility and carrier states within the various species of Anseriformes of this continent. A more detailed study of this disease is warranted.

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