POSSIBLE RESERVOIR HOST OF EQUINE MORBILLIVIRUS IDENTIFIED

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Investigations by a team from the Queensland Department of Primary Industries (DPI) into the reservoir of equine morbillivirus has produced evidence that a related virus (bat paramyxovirus) is present in two of four *Pteropus* species of fructivorous bats with an antibody prevalence of about 20%. Insufficient samples have been examined to date from the other two species to determine if they also have antibody.

Equine morbillivirus has been associated with two separate incidents involving fatal disease in humans and horses[1,2]. The first incident occurred in August 1994 in Mackay, Queensland. Two horses were infected and died after a severe, acute illness. Transmission apparently occurred to one human who developed recurring encephalitis resulting in death about 12 months later.

The second incident occurred in September 1994 in Brisbane, about 1,000 kilometres south of Mackay. In this incident, 21 horses were infected of which 14 died or were euthanased. Transmission occurred to two humans, one of whom died after a short illness. A paramyxovirus was isolated from lungs of two Brisbane horses. An identical virus was also isolated by the Australian Animal Health Laboratory (AAHL) which was subsequently described as equine morbillivirus[3]. In spite of intensive investigations, no connection has been established between the two incidents.

Work at AAHL has shown that the virus obtained from horses in the Brisbane and Mackay incidents are identical, indicating a common source[3,4].

In the DPI's considerations of possible reservoir hosts, the following criteria were applied to prioritise species for investigation:

- the species should be present in both the Brisbane and Mackay areas;
- the species should be capable of migrating between these areas, and
- contact with horses should be possible.

The two groups of animals which readily fitted this description were birds and bats. Because EMV is a mammalian virus and because transmission of paramyxoviruses from birds to mammals is uncommon, bats were given a higher priority than birds.

In addition to focussing on bats, considerable time and effort has been devoted to serological surveys of domestic animals and wildlife. To date, 5,264 sera from 46 species have been tested, including 263 samples from 34 species of wildlife. None of these animals has shown any indication of antibody to the test antigen, indicating that infection is uncommon.

Examination of a relatively small sample of fruit bats has shown a seroprevalence of the bat virus of about 20% (11 positive of 55 tested). Serology has been carried out using an ELISA (enzyme-linked immunosorbent assay) and confirmed by neutralisation tests at the AAHL.

Speculation about how the bat paramyxovirus might be introduced to other species, including horses and humans, assumes that there is a connection between the two viruses. One possibility is that infection of horses in Brisbane and Mackay may have only occurred after a very unusual event, or that a change in the bat virus resulted in a virus which was more virulent for horses, or perhaps both conditions were necessary.

Our next tasks are to isolate virus from as many species and locations as possible and to describe the natural history of infection in bats. When more is known about how the virus behaves in its natural host, it may be possible to devise testable hypotheses about how infection of other species may occur.

References

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