

ISOLATION OF PARAMYXOVIRUS TYPE 4 FROM *OECIACUS HIRUNDINIS* BUGS

M. GREŠÍKOVÁ, J. NOSEK, F. ČIAMPOR, M. SEKEYOVÁ, R. TUREK

Institute of Virology, Slovak Academy of Sciences, 809 39 Bratislava, Czechoslovakia

Received September 27, 1979; revised January 21, 1980

Summary. — Three virus strains were isolated from a total of 1356 *Oeciacus hirundinis* bugs collected in nests of *Delichon urbica* in Slovakia by inoculation of chick embryos into the amniotic and allantoic cavities. The strains agglutinated rooster and guinea pig erythrocytes and were identified as paramyxovirus type 4.

Key words: paramyxovirus type 4; *Oeciacus hirundinis* bugs; bird ectoparasites

In the course of studies on virus — vector relationships we examined *Oeciacus hirundinis* bugs collected in nests of *Delichon urbica* for the presence of ortho- and paramyxoviruses and arboviruses. We are reporting the isolation of 3 virus strains that agglutinated rooster and guinea pig erythrocytes.

In January, 1979 we collected 1356 (895 adult and 461 2nd—5th instar) *O. hirundinis* bugs in nests of *D. urbica* in the locality Pezinská Baba (West Slovakia). The bugs were washed 3 times in saline with antibiotics. Suspensions were prepared from pool (5 adults or 10 2nd—5th instar individuals) of *O. hirundinis* in basal Eagle's medium supplemented with 5% heated calf serum and antibiotics. The clarified suspensions were inoculated 1) in 0.1 ml volumes into the amniotic and allantoic cavities of 10-day-old chick embryos and 2) in 0.01 ml volumes intracerebrally into 2—3 days old suckling mice.

The amniotic and allantoic fluids harvested after 72 hr of incubation at 36 °C were examined in haemagglutination (HA) tests on plastic panels (Palmer *et al.*, 1975) with rooster and guinea pig erythrocytes. In addition, the allantoic fluid was subjected to high speed centrifugation and the resuspended pellets were negatively stained with 2% phosphotungstic acid (PTA) at pH 7.5 and examined at 80 kV in a Philips EM 300 electron microscope.

The 225 *O. hirundinis* suspensions examined in chick embryos yielded 3 virus strains. Two and one strain was isolated and reisolated from 461 2nd—5th instar and 895 adult bugs, respectively.

Electron microscopy of the infected allantoic fluids revealed numerous particles showing a structure typical of paramyxoviruses. They were polymorphous with HA-NA spikes. The nucleoprotein released from damaged particles had a diameter of 17—18 nm and showed the presence of a central canal (Figs 1 and 2).

The isolated virus strains agglutinated both rooster and guinea pig erythrocytes. The HA titre of the strains in their 2nd chick embryo passage varied

from 128 to 512. The strains were identified by Dr. B. Tůmová, Czechoslovak Influenza Centre, Prague, as paramyxovirus type 4. Details on the identification will be published by Dr. Tůmová elsewhere.

The results of isolation attempts in suckling mice were negative.

Paramyxoviruses were isolated from wild living birds (Webster *et al.*, 1976), but the mechanism of their transmission in nature remains unknown.

O. hirundinis is a typical haematophagous insect, living in nests of *D. urbica*. This bird ectoparasite attracted our interest as a possible virus vector. Our first experiments carried out in the winter of 1979 on 1356 bugs yielded 3 virus strains, identified as paramyxovirus type 4. The infection rate was 0.1% in adult and 0.4% in 2nd–5th instar bugs. Transstadial virus transmission can thus be assumed.

Our findings confirmed the known fact that arthropods may serve as a source of a variety of infectious agents. It remains obscure which role is paid by *O. hirundinis* bugs in paramyxovirus circulation in the nature.

Acknowledgement. We thank Mrs. Z. Bolečková and Mrs. V. Bieliková for excellent technical assistance.

References

- Palmer, D. F., Coleman, M. T., Dowdle, W. R., and Schild, G. C. (1975): *Advanced Laboratory Techniques for Influenza Diagnosis*. Comm. Dis. Center, Atlanta.
- Webster, R. G., Morita, M., Pridgen, C., and Tůmová, B. (1976): Ortho- and paramyxoviruses from migrating feral ducks: Characterization of a new group of influenza A viruses. *J. gen. Virol.* **32**, 217–225.

Explanation of Electron Micrographs (Plates XVI and XVII):

Fig. 1. Virus particle showing a paramyxovirus structure. $\times 181\,500$.

Fig. 2. Nucleoprotein released from a virus particle (arrows) with paramyxovirus morphology, $\times 108\,900$.