

HAEMAGGLUTININATING ACTIVITY OF VARIOLA VIRUS

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The haemagglutinating activity of 15 strains of variola virus isolated from materials collected in different geographic areas (India, Nepal, Kenya, etc.) from patients with smallpox of different severity was investigated.

Virus-containing suspensions from chick embryo chorioallantoic membranes (CAM) at the 2nd-4th passage level were employed in the experiments. The only exception was the Erm strain which had undergone 10 chick embryo passages. The Tashkent strain of vaccinia virus served as control.

Rooster, turkey, duck, goose and *Macaca rhesus* erythrocytes were used in the form of 1% suspensions in saline, pH 7.2. The specificity of the haemagglutination (HA) tests was checked by HA inhibition tests with anti-vaccinia immune serum.

From 3 to 50 samples of erythrocytes from each animal species were tested. These tests confirmed the considerable variability in individual sensitivity of erythrocytes to vaccinia virus. The most sensitive erythrocyte samples were selected for experiments on the 15 strains of variola virus.

None of the variola virus strains examined agglutinated monkey, goose or duck erythrocytes, in spite of that duck erythrocytes gave a positive HA reaction with vaccinia virus.

Freshly prepared suspensions of all the 15 variola virus strains agglutinated rooster and turkey erythrocytes. The HA titres varied in individual strains from 1:5 - 1:160 with rooster erythrocytes and from 1:5 - 1:80 with turkey erythrocytes. Three strains (Ter, I-3a and Dul), isolated from severe forms of smallpox, yielded the highest titres.

Tests on the stability of haemagglutinins showed that keeping virus suspensions at 4° C for 5 months had no obvious effects, whereas at -20° C the HA titre decreased 4-8-fold within 5 days. Keeping of virus in the form of infected CAM at -20° C for 14 months (the longest period tested) did not affect the HA titres.

The present experiments showed that monkey and goose erythrocytes are not agglutinated by either variola or vaccinia virus. Duck erythrocytes proved to be sensitive to vaccinia virus only, while all 50 samples of turkey erythrocytes tested and the majority of rooster erythrocytes were agglutinated by either virus. The tests revealed variability in the sensitivity of erythrocytes from individual roosters and turkeys. The HA test with vaccinia virus was more intensive than that with variola virus. The present results concerning the sensitivity of turkey erythrocytes are in accordance with data by Datt (1) on turkey erythrocytes and vaccinia virus.

Reference

1. Datt, N. S. *Nature (Lond.)* **203** : 1404, 1964.