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SEROLOGIC RELATIONSHIPS BETWEEN PARAVACCINIA VIRUSES

(a short communication)

(Following is a translation of an article by H. Liebermann, Friedrich-Loeffler-Institut, Insel Riems of the German Academy for Agricultural Sciences, Berlin, published in the German periodical Arch. Exp. Vet. 20: 1966, pages 1353-54. Translation performed by Constance L. Lust.)

Because of the common morphology the viruses of Stomatitis papulosa, bovine utterpox (pseudo cowpox), as well Dermatitis postulosa can be grouped together in the subgroup Paravaccinia viruses within the pox group. (Buttner et al. 1964, Lauder et al. 1966, Liebermann 1967). Of primary importance for the determination of relationships of viruses are besides their common morphology the serologic relationships between the viruses named above. Since recent experiences have shown that neutralizing antibodies are difficult (or impossible) to demonstrate in illnesses of cows, sheep as well as humans, we used the fluorescence-serological method to compare paravaccinia antigens in infected cell cultures. For these trials we used 1) Utterpox (pseudo cow pox), 3 Melkerknoten virus strain, Dermatitis-postulosa (DP), and over 20 strains of the Stomatitis papulosa (St-p) which we isolated from slaughtered beef (Liebermann and Urbaneck 1966). Hyperimmune serum was produced in calves by repeated intravenous, intramuscular and subcutaneous injections of large amounts of high-titer cell-culture virus. The globulin fraction was labeled with fluorescence isothiocyanate according to the method of Olechnowitz et al. (1965). To prove virus immunohistochemically the direct method was used. As blanks served labelled Stomatitis vesicularis (St-v) and mucosal-disease-hyperimmune serum (St-v infected and non infected controls cell cultures for inherent fluorescence).

With labeled St-p and Dp-hyperimmune serum the St-p and Dp virus infected calf kidney and other structures could be demonstrated as well as Utterpox virus infected cells. Specific fluorescent structures were demonstrated. The appearance of specific fluorescence was partly dependent on the virus-cell relationship and was localized especially in the inclusion bodies of the cytoplasm (Flowright et al. 1966, Liebermann and Urbaneck 1966, Urbaneck and Liebermann 1966) Nuclear fluorescence was not demonstrated. In no case was a specific fluorescence seen in Dermavaccine (Vaccinia) infected cultures as well as other viruses with the St-p and Dp sera.

From the fluorescent seroligical investigations it was concluded that the viruses of Stomatitis papulosa, Dermatitis pustulosa, and pseudo vaccinia, Utterpox, were closely related with each other serologically. The identity of single virus strains cannot be determined

in this way (Liebermann 1967). These viruses differentiate themselves fluorescent-serologically from the variola-vaccinia group. The above named viruses can therefore be placed in one group, based on serologic studies, and can be differentiated from known subgroups of pox viruses. The experimental documentation of these results can befound in the work of Liebermann (1967).

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