

C absorbed all the agglutinins from serums prepared against B and C.

B failed to absorb all the agglutinins from either A or C.

This could be explained on the hypothesis that strain A contained agglutinogenic substances A and B; that strain C contained agglutinogenic substances B and C; but that strain B contained only agglutinogenic substance B. It is realized that such a statement is probably a crudely symbolic method of indicating the difference in physico-chemical composition of these different races.

Many other strains have been encountered which on simple absorption tests seem to fall into each of these 3 groups. Agglutinating sera had been prepared against 1 or 2 representatives of each group and on reciprocal absorption tests the strains appeared completely homologous with those on which tests are here recorded. These strains therefore probably represent groups and not individual variants. So far, no members of groups B or C have been found in frankly pyogenic processes, but the number tested is insufficient to make this finding more than suggestive. Similar relationships have been found by Krumwiede and others in the Gram-negative bacilli but these findings are here reported because they present an unusually clear-cut instance of such reciprocal agglutinating relationships.

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Immunologic Reactions with Tobacco Mosaic Virus.

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A study of the immunologic reactions with a tobacco mosaic virus to an antiserum from rabbits has been undertaken with the hope of throwing more light upon the nature of the virus.

Antisera were produced separately by intravenous injections of rabbits with sap extracted from healthy Turkish tobacco plants, and sap from plants affected with tobacco mosaic virus. In several series of alexin-fixation experiments, each antiserum was titrated with its homologous and heterologous antigen. The higher titer for a given antiserum was obtained with the homologous antigen. These results are in agreement with Dvorak,¹ who compared the precipitin reac-

tions of an antiserum to healthy potato sap with those of an antiserum to sap extracted from mosaic diseased potato plants.

Precipitin-absorption tests further demonstrated the presence of a highly specific precipitin in the antiserum to virus-sap.

The preventive action of specific antiserum upon virus-sap *in vitro* was demonstrated by the inability of antiserum-virus mixtures, that had stood at room temperature for several hours, to induce mosaic disease when inoculated into healthy tobacco plants. Under the same set of conditions, normal rabbit serum and antiserum to healthy tobacco sap did not exhibit the preventive action upon virus that the specific antiserum showed. Fresh antiserum to virus-sap exerted a stronger inhibiting action than the same antiserum, inactivated by a temperature of 56° C. for one-half hour. Heated antiserum could be reactivated by the addition of fresh rabbit or guinea pig serum, so that the reactivated antiserum produced the same preventive action upon virus as the active antiserum.

¹ Dvorak, M., *J. Infect. Dis.*, 1927, xli, 215.