

## Two New *Salmonella* Types with Undescribed Flagellar Antigens.\*

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A. *Salmonella simsbury*. The only culture of *Salmonella simsbury* encountered was received from Mr. E. K. Borman, who identified the organism as a *Salmonella* and sent it to writers for antigenic analysis. The bacillus was isolated from the feces of a normal human carrier. On subsequent examination no *Salmonella* could be isolated from this individual.

The organism was a motile bacillus which possessed the morphological, cultural and biochemical characteristics generally attributed to the genus *Salmonella*. Acid and gas were produced from glucose, arabinose, xylose, rhamnose, maltose, trehalose, dulcitol and sorbitol. Lactose, sucrose, inositol, adonitol and salicin were not attacked. Dextro-tartrate, levo-tartrate, mucate and citrate were fermented but meso-tartrate was not utilized. The organism produced hydrogen sulphide but did not form indol nor liquefy gelatin.

Alcohol-treated suspensions of the organism were agglutinated strongly by *S. senftenberg* (I, III, XIX) serum and to a lesser degree by *S. anatum* (III, X, XXVI) and *S. newington* (III, XV) serums. When used as antigen in absorption tests, *S. simsbury* removed all somatic agglutinins from *S. senftenberg* serum. *S. simsbury* was then used to prepare an agglutinating serum and it was found that all somatic agglutinins were removed from the serum when it was absorbed with *S. senftenberg*. The somatic antigens of *S. senftenberg* and *S. simsbury* are identical and are represented by the formula I, III, XIX.

When a formalized broth culture of *S. simsbury* was tested with serums derived from all the known flagellar antigens of the *Salmonella* group, it was flocculated by none of them. Likewise, *S. simsbury* serum which had a flagellar titer of 1 to 20,000 for the homologous strain, failed to flocculate any of the known flagellar antigens in a dilution of 1 to 100. It is apparent that the flagellar antigens of *S. simsbury* are not related to any of those hitherto de-

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scribed and to them is assigned a new symbol,  $z_{27}$ . The antigenic formula of *S. simsbury* is I, III, XIX:  $z_{27}$ .

B. *Salmonella tennessee*. The sole representative of this type was received from Dr. W. C. Williams. It was isolated in the laboratories of the Tennessee Department of Health from the feces of a normal carrier who was employed as a food handler in a fraternity house, a number of the occupants of which were affected with food poisoning. No paratyphoid bacilli were isolated from the cases of food poisoning. Except for prompt production of acid and gas from inositol by *S. tennessee*, its cultural and biochemical characteristics were the same as those given for *S. simsbury*.

On serologic examination alcohol-treated suspensions of the bacillus were agglutinated strongly by *S. thompson* (VI, VII) serum and to a lesser degree by *S. newport* (VI, VIII) serum. When tested with single-factor serums it was found to react both with VI<sub>1</sub> and VI<sub>2</sub> serums of Kauffmann<sup>1</sup> and with VII serum. It was unaffected by VIII serum. When used as antigen in absorption tests, *S. tennessee* removed all somatic agglutinins from *S. thompson* serum. Likewise, an agglutinating serum prepared from *S. tennessee* was exhausted of somatic agglutinins by absorption with *S. thompson*. The somatic antigens of *S. tennessee* are VI, VII.

The flagellar antigen of *S. tennessee* had little serologic relationship to those of any of the known *Salmonella* types. Formalized broth cultures of the organism were not flocculated by any of the serums representative of the recognized flagellar antigens. An agglutinating serum derived from *S. tennessee*, which had a flagellar titer of 1 to 40,000 for the homologous strain flocculated the specific phase of *S. glostrup* ( $z_{10}$ ) in a dilution of 1 to 400. It failed to agglutinate any of the other known *Salmonella* antigens in a dilution of 1 to 100. To the flagellar antigen of *S. tennessee* a new symbol,  $z_{29}$ , is assigned. The antigenic formula of the organism is VI, VII:  $z_{29}$ .

*Summary.* Two new *Salmonella* types with undescribed flagellar antigens were reported. *Salmonella tennessee* was represented by the antigenic formula, VI, VII:  $z_{29}$ . The antigens of *Salmonella simsbury* were characterized as I, III, XIX:  $z_{27}$ . Each type is represented by a single strain isolated from the feces of normal human carriers.

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<sup>1</sup> Kauffmann, *Z. f. Hyg. u. Infektionskr.*, 1937, **120**, 177.