Lactose-Fermenting Salmonella

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Salmonella species are generally considered to be unable to ferment lactose and sucrose according to Bergey's Manual. Recently, however, J. M. Bulmash, McD. Fulton, and J. Jiron (J. Bacteriol. 89:259, 1965) and L. J. Kunz and W. H. Ewing (J. Bacteriol. 89:1629, 1965) have reported two separate species of Salmonella capable of fermenting lactose and sucrose. The organism reported here again illustrates that certain strains of Salmonella are capable of fermenting lactose and sucrose rapidly and can resemble very closely lactose-fermenting members of the Enterobacteriaceae. The organism isolated was the etiological agent of a rapidly fatal sepsisemia resulting from an infection of the uterus in a 21-year-old female during the first trimester of pregnancy, who aborted spontaneously. The organism was isolated from the blood and placental tissue during the course of illness and from postmortem blood and uterine cultures.

Primary isolates of the organism on MacConkey agar (Difco) resembled a coliform organism, owing to their rapid fermentation of lactose. Results of primary biochemical reactions led to a tentative identification of the organism as a strain of Citrobacter freundii. Because of the fulminating nature of the infection, further biochemical investigation of the organism was indicated. Inconsistencies were noted between expected results of C. freundii and those obtained with the organism under investigation with regard to the ability to decarboxylate certain amino acids. Results of serological agglutinations with Salmonella polyvalent antiserum indicated a serological resemblance to a Salmonella species. The organism was forwarded to W. H. Ewing, Communicable Disease Center, Atlanta, Ga., who identified it as a lactose- and sucrose-fermenting strain of S. tennessee.

Table 1 clearly illustrates the close resemblance, both biochemically and serologically, between S. tennessee and C. freundii. The results are evidence that the ability or failure to attack lactose, alone, cannot be depended upon for the separation of the Salmonella species from other lactose-fermenting organisms. The accurate differentiation between S. tennessee and C. freundii must be made on the basis of decarboxylase reactions and serological agglutinations.
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