Brucella Strains from Mouselike Rodents in Southwestern USSR

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Brucella strains isolated from mouselike rodents in the northern foothills of the Large Caucasus are phenotypically similar to *Brucella suis*. On the basis of several differential characteristics, these strains are considered to be a new biotype of *B. suis*.

During the last 20 years, strains of *Brucella* have been recovered from some species of mice and mouselike rodents (*Apodemus agrarius* Pall., *Mus musculus* L., *Apodemus sylvaticus* L., *Microtus arvalis* Pall., *Micromys minutus* Pall.) in the northern foothills of the Large Caucasus. Investigations of these strains by several workers (1, 2, 6) produced contrasting opinions concerning the taxonomic position of these isolates.

In this paper we report the results of taxonomic studies of rodent strains of *Brucella* that were conducted as recommended by the Subcommittee on Taxonomy of the genus *Brucella* (3).

A total of 66 *Brucella* strains isolated from mouselike rodents in S-form were selected for this study. International reference strains *Brucella melitensis* 16-M^T (type strain) biotype 1, *Brucella abortus* 544^T biotype 1, *Brucella suis* 1330^T biotype 1, *B. suis* Thomsen biotype 2, *B. suis* 686 biotype 3, and *B. suis* 40 biotype 4 were used for comparison. These strains were obtained from the Laboratory of Brucellosis, Gamaleya Institute of Epidemiology and Microbiology, Moscow.

The morphological and staining characteristics of the rodent strains were typical of *Brucella*. Cultures grew aerobically and did not produce hydrogen sulfide. The rodent isolates studied, as well as the other *Brucella* strains, hydrolyzed urea and contained neuraminidase with an activity of 135 HE. All strains grew in the presence of thionine at standard concentrations of 1:25,000, 1:50,000, and 1:100,000. Growth was inhibited by basic fuchsin (1:50,000, 1:100,000). The rodent strains were lysed by brucellaphages Wb (Weybridge) and Bk₂ (Berkeley) at 1 and 10⁴ routine test dilutions and by phages Tb (Tbilisi) and Fi (Firenze) only at 10⁴ routine test dilutions, which is characteristic of *B. suis*. These strains were agglutinated with

monospecific anti-*B. melitensis* serum at a titer of 1:320, but not with anti-*B. abortus* serum. These results differentiate the rodent strains from the previously described biotypes of *B. suis*. Oxidative metabolism tests (5) showed that the rodent strains oxidized L-arginine, DL-ornithine, DL-citrulline, and L-lysine. Oxidation of these substrates is characteristic of *B. suis*. However, unlike *B. suis*, the rodent strains also oxidized L-alanine, L-asparagine, and L-glutamic acid. Standard concentrations of pyronin B (1:800,000), safranin T (1:500,000), gentian violet (1:500,000), and crystal violet (1:2,000,000) suppressed growth of the rodent strains but did not inhibit growth of the reference strains. This feature differentiates the rodent strains. The lipopolysaccharides from the rodent strains were similar to those of the reference strain of *B. suis* in chemical composition, antigenic structure, and toxicity for white mice.

An investigation of the protein spectra of *Brucella* strains by disc gel electrophoresis in polyacrylamide gels (4) showed that the *Brucella* strains isolated from mouselike rodents had proteinograms identical to those of reference strains of *B. suis* characterized by the presence of fractions with an *R_f* value of 0.85.

Thus, the ability to agglutinate with monospecific anti-*B. melitensis* serum, the greater susceptibility to pyronin B, safranin T, gentian violet, and crystal violet, and the ability to oxidize L-alanine, L-asparagine, L-glutamic acid, L-arginine, DL-ornithine, DL-citrulline, and L-lysine indicate that the rodent strains comprise an independent biotype of *B. suis*. We designate strain *B. suis* 514 of our collection as the representative reference strain.

LITERATURE CITED

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