

## THE LIMITED VALUE OF ANTIPHAGE SERUM FOR THE BACTERIOLOGICAL DIAGNOSIS OF BRUCELLOSIS (\*)

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The presence of bacteriophage in *Brucella* from infected people and animals, often makes it difficult to isolate the organisms. When cultured on nutrient media the organisms may be completely lysed by their own bacteriophage (Drozevkina, 1955). It has been demonstrated by Fomicieva *et al.* (1955, (1955) and Fomicieva and Balandin (1956), that the use of media containing antiphage serum increases by two-and-a-half to three times the chances of successful *Brucella* isolations and the time required for the test is considerably reduced. The foetal specimens cultured on media containing antiphage serum frequently yield an abundant and typical growth of *Brucella* organisms (Fomicieva, 1960). Drozevkina (1959) produced an antiphage serum in horses and used it for bacteriological diagnosis of brucellosis in Russia, a method which has been approved by the Ministry of Health.

To obtain further information about the value of antiphage serum in the bacteriological isolation of *Brucella*, antiphage serum was prepared in laboratory animals. A group of five rabbits and another of five chickens were each injected intramuscularly with concentrated *Brucella* bacteriophage type abortus, Strain 3, (titre  $10^{16}$  PFU, prepared in this laboratory) twice a week for six consecutive weeks. Aluminium gel was used as an adjuvant in preparing the antiphage serum. Rabbits and chickens were bled by cardiac puncture. The serum was assayed for antiphage activity by the method of Adams (1959).

The antiphage serum was filtered through a seitz filter and stored in 2 ml. amounts at  $-20^{\circ}\text{C}$ . The serum neutralisation constant (K value) was calculated as follows:

$$K = 2.3 \times D/t \times \log P_0/P$$

in which  $P_0$  = phage assay at zero time,  $P$  = phage assay at time  $t$  min.,  $D$  = final dilution in the phage serum mixture. The antiphage serum obtained from the chickens had a much higher K value (46,000) compared with serum from rabbits (2,300).

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With antiserum

Without antiserum

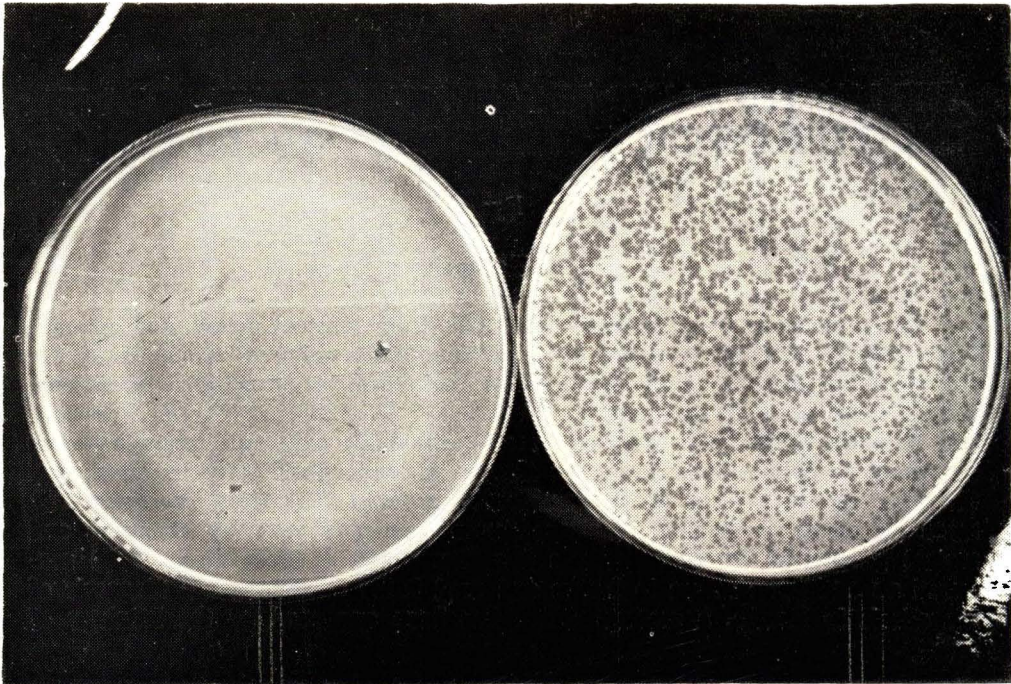


FIG. 1.—Assay of Antiphage, the Serum Dilution of 1:1,000 Inactivates 100 per cent. of the *Brucella* bacteriophage in five minutes.

In order to determine the value of antiphage serum in the isolation of *Brucella* a total of 32 foetal specimens from cows was tested. The same materials were cultured on ordinary media and on media covered with antiphage serum. From eight of the foetal specimens *Br. abortus* was isolated. The number of cases in which *Brucella* was isolated on media containing antiphage serum was the same as that on ordinary media. However, the period required for the test in media containing antiphage serum was markedly reduced and yielded a more abundant growth of typical *Brucella* organisms.

From this experiment it can be concluded that the use of antiphage serum for the bacteriological diagnosis of brucellosis has a limited value.

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