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Brief Communication

THE ISOLATION OF A TREPONEMA HYODYSENTERIAE-LIKE ORGANISM ASSOCIATED WITH SWINE DYSENTERY IN NORWAY

The various aspects of swine dysentery (SD) have recently been reviewed by *Harris* (1974). The aetiology has been considerably clarified by *Harris et al.* (1972) who isolated a spirochaete which was named Treponema hyodysenteriae and reproduced the disease with this organism.

In Norway a disease termed "fibrinous colitis", similar to SD occurred during the period 1965—67 (*Nordstoga et al.* 1968). However, no causal agent was isolated. The isolation and propagation of a spirochaete from a typical case of SD are described in the following.

Colon from a 4 months old pig was received for examination. The pig originated from a herd in which intestinal disturbances had occurred for about 1 year. The pig was killed when showing profuse mucohaemorrhagic diarrhoea, and necropsy showed pseudomembraneous colitis as the most prominent finding. The pseudomembranes were removed, homogenized and diluted 1:5 in saline and the suspension centrifuged at low speed for 5 min. Further dilutions to 1:200 were made and pre-reduced 5 % bovine blood agar plates were inoculated from each dilution. The plates were incubated anaerobically in Gas Pak jars (BBL) at 37°C for 4 days. Pure cultures were obtained by subculturing on trypticase soy broth (BBL) supplemented with 0.1 % agar and 10 % calf serum, as described by *Kinyon & Harris* (1974). For the purpose of isolating Vibrio coli, thioglycollate medium (Difco) supplemented with 1.5 % agar and 10 % blood was inoculated and incubated for 3 days in an atmosphere containing 10 % carbon dioxide. Moreover, routine bacteriological procedures were performed.

Three 10 weeks old pigs from a herd with no history of SD were used as experimental animals. Spirochaetes were not observed microscopically in rectal swabs collected prior to inoculation. Cultures from the third passage from 8 blood agar plates were homogenized in 500 ml saline, and each of 2 pigs received orally 250 ml of the suspension after 250 ml 0.1 M phosphate buffer, pH = 7.2, had been given in order to neutralize the acid

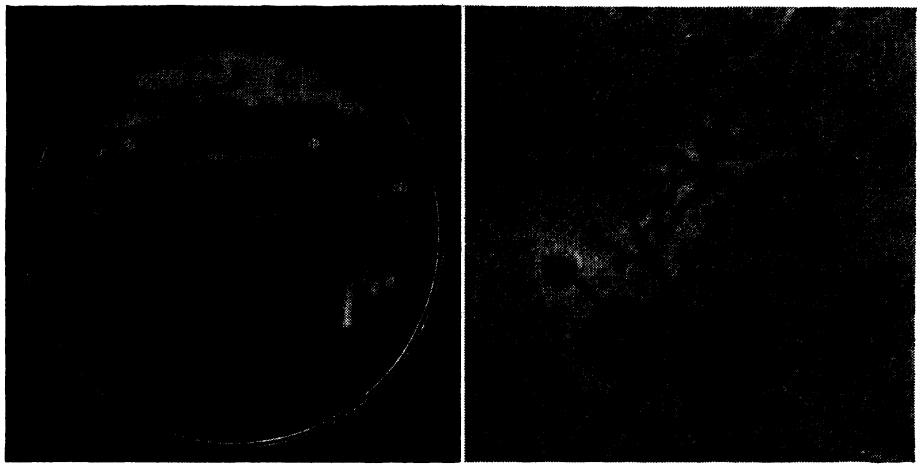

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Figure 1. Haemolytic zones produced on pre-reduced blood agar plates by a Treponema hyodysenteriae-like organism after 4 days' incubation.

Figure 2. Phase-contrast microscopy of Treponema hyodysenteriae-like organisms illustrating the helical form of the organisms. 2550 ×.

pH of the stomach. The third pig served as control and the animals were observed for 1 month.

Phase-contrast microscopy of the concentrated suspension of the colonic mucosa from the SD affected pig revealed numerous spirochaetes. Anaerobic cultures on blood agar resulted in wide zones of complete haemolysis with scarcely visible surface growth (Fig. 1). Occasionally, white translucent colonies were present in the zones. The ability to produce haemolysis was lost after 3 subcultures. Phase-contrast microscopy of the haemolytic zones showed large, loosely and helically coiled spirochaetes moving in a snake-like manner (Fig. 2).

Cultures on thioglycollate blood agar and blood agar, respectively, resulted in abundant growth of V. coli and *Escherichia coli serotype 0145. Salmonella species were not isolated.

No clinical signs were observed in the inoculated pigs during 4 weeks after inoculation.

The isolation of the spirochaete described from a case of SD does not prove that the organism was the cause of the disease. Although electronmicroscopic examinations were not performed

* Serological typing was performed by Dr. L. Sørum at the National Veterinary Institute, Oslo.

as done by *Harris et al.*, the organism showed striking similarity to T. hyodysenteriae with regard to morphology, growth characteristics and requirements.

Concerning the isolation of V. coli, *Hamdy & Glenn* (1974) showed that V. coli may contribute to the severity and chronicity of SD experimentally produced by T. hyodysenteriae. The isolated strain of V. coli may have played a similar role in the case described. E. coli type 0145 does not belong to any of the pathogenic serotypes listed recently by *Søderlind* (1974). The failure to produce the disease in experimental animals does not preclude the possibility of the isolated spirochaete being the causal agent of SD in the spontaneous case. The experiment included only 2 inoculated animals. Furthermore, the organism might have lost pathogenicity at the time of inoculation or the pigs might have acquired immunity through colostrum. *Harris et al.* succeeded in reproducing the disease in 50 % of their experimental animals.

Further studies on the isolated spirochaete, and in addition, on spirochaetes which have been so far observed in other cases of SD, are in progess in order to elucidate the possible pathogenic role these organisms may play in this disease in Norway.

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