

Brief Communication

INFECTION WITH ACTINOBACILLUS SUIS IN PIGS

Actinobacillosis in pigs seems to be relatively rare and when it does occur, it usually manifests itself as acute septicaemia during the first weeks of life (Zimmermann 1965). Polyarthrititis, pneumonia and heart lesions as well as petechial haemorrhages in skin, viscera and kidneys are also frequently found (MacDonald *et al.* 1976, Jones & Simmons 1971). Both *Actinobacillus suis* and *Actinobacillus equuli* have been isolated from such cases (Pedersen 1977).

The present communication reports the isolation of an *A. suis*-like organism from a piglet from a 1 week old litter in which 7 out of 10 littermates died within 24 hrs. after onset of the first symptoms. The symptoms observed were increased rate of respiration and cyanotic discolouration of the extremities.

Necropsy of the piglet showed congestion and mucopurulent coating of the nasal mucosa. The lungs were oedematous with small, dark red, firm areas. The heart was dilated and had a subaortic septal defect. The atrioventricular and semilunar valves were hyperaemic and showed a verrucose endocarditis. The spleen and the liver were enlarged and congested. There were small greyish spots scattered throughout the parenchyma of the liver which histologically proved to be areas of focal necrosis infiltrated with inflammatory cells at the periphery of the necrosis. The liver also showed a certain proliferation of haematopoietic cells and congestion in the sinusoids. Pathological changes in other organs were not observed. Histological examination was only carried out for the liver.

Material from liver and spleen was inoculated onto blood agar plates for aerobic and anaerobic incubation. After overnight incubation at 37°C there was abundant growth of an aerobic, facultatively anaerobic Gram-negative organism. The colonies were transparent with a diameter of about 1—1.5 mm, and were smooth and viscous in consistency. On bovine blood agar a narrow zone of weak haemolysis was seen. On sheep blood agar, the zone of haemolysis was more distinct and extensive. The colo-

nies were not adherent to the agar. In serum broth the organism showed viscous growth.

Intra-peritoneal inoculation of mice with a 24 hrs. broth culture of the organism resulted in death of the mice within 12 hrs. The inoculated organism was recovered in pure culture both from peritoneal exudate and liver. Biochemical characteristics of the isolated organism are listed in Table 1.

Table 1. Biochemical characteristics of the isolated organism.

Aesculin	+	Melbiose	+	Oxydase	—
Arabinose	+	Raffinose	+	Citrate	—
Cellobiose	+	Rhamnose	—	Indol	—
Glucose	+	Salicin	+	H ₂ S	— (in TSI agar)
Lactose	+	Sorbitol	—	Nitrate reduction	+
Maltose	+	Trehalose	+	Growth on MacConkey agar	+
Mannose	+	Urease	+		
Mannitol	+	Catalase	—		

The actinobacilli isolated from actinobacillosis in pigs seem to vary both culturally and biochemically. Haemolytic strains have been identified as *A. suis*, while non-haemolytic strains mainly have been classified as *A. equuli*. Two variants are also described in the 8th ed. of Bergey's Manual of Determinative Bacteriology, where *A. suis* is listed as species incertae sedis. The present strain can be distinguished from *A. equuli* and *A. lignieresii* by its haemolytic activity, its ability to hydrolyse aesculin and to produce acid from arabinose, cellobiose and salicin. *A. equuli* and *A. lignieresii* are in contrast to *A. suis* non-pathogenic to mice. The present strain produces acid from mannitol. Inability to produce acid from mannitol is emphasized by some workers as being an important diagnostic criterion for *A. suis*, though other workers, as reviewed by *Mair et al.* (1974), do not.

The cultural, biochemical and pathogenic characteristics of the isolated organism seem to justify its classification as *A. suis*. According to the criteria listed in Bergey's Manual, it corresponds to the strain described by *van Dorssen & Jaartsveld* in 1962. The clinical history of the affected litter and the pathological findings in heart and liver are also consistent with a diagnosis of actinobacillosis. The piglet submitted to necropsy and

bacteriological examination may, however, have been predisposed to infection due to the subaortic septal defect.

Eivind Liven and *Hans Jørgen Larsen*

The Department of Microbiology and Immunology, and

Bjørn Lium

The Department of Pathology,

Veterinary College of Norway, Oslo.

REFERENCES

- Jones, J. E. T. & J. R. Simmons*: Endocarditis in the pig caused by *Actinobacillus equuli*: a field and experimental case. *Brit. vet. J.* 1971, 127, 25—29.
- MacDonald, D. W., M. P. Hewitt, G. S. Wilton, S. Rawluk & L. Childs*: *Actinobacillus suis* infections in Alberta swine, 1973—1975. Pathology and bacteriology. *Canad. vet. J.* 1976, 17, 251—254.
- Mair, N. S., C. J. Randall, G. W. Thomas, J. F. Harbourne, C. T. McCrea & K. P. Cowl*: *Actinobacillus suis* infection in pigs. *J. comp. Path.* 1974, 84, 113—119.
- Pedersen, K. B.*: *Actinobacillus* infections in swine. *Nord. Vet.-Med.* 1977, 29, 137—140.
- Van Dorssen, C. A. & F. H. J. Jaartsveld*: *Actinobacillus suis* (novo species) een bij het varken voorkomende bacterie. (*Actinobacillus suis* (novo species), a bacterium occurring in swine). *T. Diergeneesk.* 1962, 87, 448—450.
- Zimmermann, T.*: Die *Actinobacillose* des Schweines. (*Actinobacillosis* in swine). *Tierärztl. Umsch.* 1965, 20, 565—568.

(Received April 24, 1978).

Reprints may be requested from: Eivind Liven, the Department of Microbiology and Immunology, Veterinary College of Norway, P. O. Box 8146, Oslo Dep., Oslo 1, Norway.

