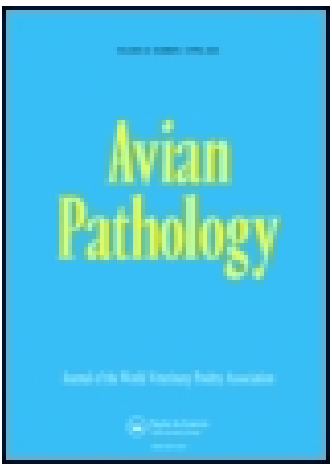

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Presence of parvoviruses in the intestine of chickens showing stunting syndrome

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SHORT COMMUNICATION

PRESENCE OF PARVOVIRUSES IN THE INTESTINE OF CHICKENS SHOWING STUNTING SYNDROME

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SUMMARY

Small viral particles of 19 to 24 nm in diameter with a buoyant density in CsCl of 1.43 g/ml were detected electron microscopically in samples taken from the gut of 10-day-old chickens suffering from a stunting syndrome. The viral particles are suggested to belong to the *Parvoviridae* and their possible role in the stunting syndrome is discussed.

During the past 5 years, a syndrome of broiler chickens characterised by stunted growth and poor feathering has been described in several countries under different names such as stunting disease, helicopter disease, malabsorption syndrome (Kouwenhoven *et al.*, 1978; Bracewell and Wyeth, 1981; Page *et al.*, 1982; Pass *et al.*, 1982; Marchi and Zanella, 1982). The disease could be transmitted by oral inoculation of intestinal homogenates from affected birds into one-day-old susceptible chickens (Vertommen *et al.*, 1980). Viruses isolated were mainly reoviruses of various serotypes (Hieronymus *et al.*, 1982), whereas Wyeth *et al.* (1981) demonstrated the presence of avian caliciviruses in the gut by electronmicroscopy. However, the disease concerned could not be unequivocally reproduced under experimental conditions with any of the isolated reoviruses.

In this short paper we report the presence of parvoviruses in the intestine of young chickens suffering spontaneously from stunting.

The extremely pale intestines from some 10-day-old dead chickens that showed a strongly retarded growth were homogenised in sterile PBS (pH 7.4). The resulting suspension was frozen and thawed three times and centrifuged at 10000 *g* for 30 min in an SW27 rotor of a Beckman ultracentrifuge, Model L2-65B. The supernatant was placed onto a 45% (w/w) sucrose cushion and centrifuged for 2 hours at 125000 *g* in the above rotor. The pellet was resuspended in 2 ml of 50 mM-TRIS-HCl-1 mM EDTA (pH 7.5) and placed on top of 8 ml CsCl with an average density of 1.4 g/ml. After 48 hours ultracentrifugation in an SW41 rotor at 200000 *g*, a wide and a narrow opalescent band were seen very close to one another. The density of the bands, measured in an ABBE refractometer, ranged between 1.42 to 1.44 g/ml.

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This material (both bands) was collected and diluted to 11 ml with PBS (pH 7.5) and the suspected viral particles were pelleted at 200000 *g* in an SW41 rotor for 1 hour. The pellet was resuspended in 0.5 ml distilled water. This suspension was used for electron microscopy employing the negative-contrast technique.

Numerous small particles were seen, a number of which showed a typical hexagonal parvovirus appearance (Fig.1). The most typical particles measured 19 to 24 nm in diameter. It should be noted that no adenovirus particles could be detected either in these fractions or in those located above.

Both the density and the morphology of the observed particles we detected are strongly suggestive of *Parvoviridae* (Bachmann *et al.*, 1975); however, further studies are necessary to confirm this assumption. The dependence of the replication of autonomously replicating parvoviruses on the host cell cycle is well known and has been associated with their pathological roles in foetopathies and diseases of young animals (Bachmann *et al.*, 1975). The similarity of the clinical picture and pathology of Derzsy's disease of the goose, which is caused by a parvovirus (Derzsy, 1967; Kisary and Derzsy, 1974), to that of infectious stunting of broiler chickens suggests a possible role of parvoviruses in the latter syndrome. Our investigations are continuing along these lines.

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RESUME

Présence de parvovirus dans l'intestin de poulets présentant le syndrome de dépérissement

De petites particules virales de 19 à 24 nm de diamètre, avec un gradient de densité en CsCl de 1, 43 g/ml ont été mises en évidence en microscopie électronique dans des échantillons d'intestin provenant de poulets âgés de 10 jours présentant le

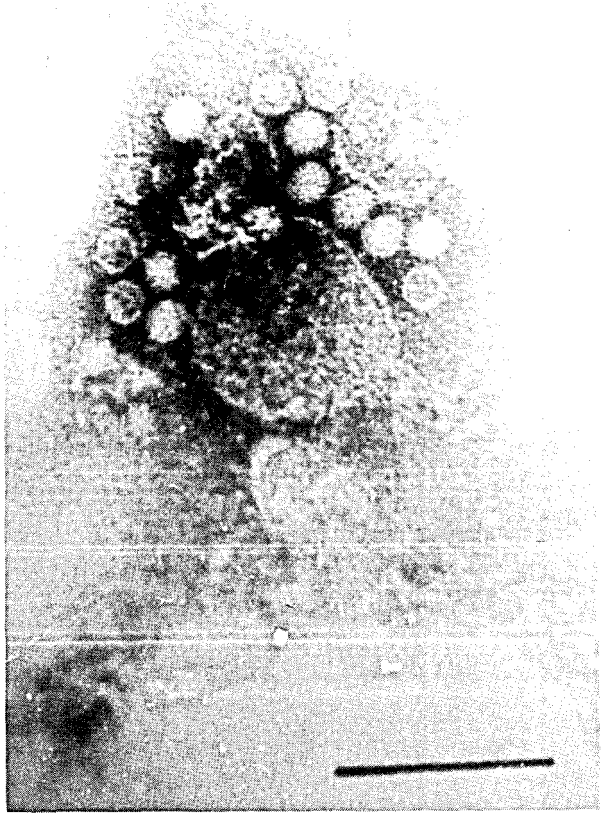

Fig. 1. Electron micrograph of parvovirus-like particles (negatively stained with 2% potassium phosphotungstate pH 6.0) measuring 19 to 24 nm, detected at 1.43 CsCl equilibrium centrifugation of intestinal sample from chickens showing the stunting syndrome. (Bar = 100 nm).

syndrome de dépérissement. Les particules virales semblent appartenir aux *Parvoviridae* et leur rôle possible dans l'étiologie du syndrome de dépérissement est discuté.

ZUSAMMENFASSUNG

Die Gegenwart eines Parvovirus in Darm von Küken mit Stuntingsyndrom

Im Elektronenmikroskop wurden in Darmproben von zehn Tage alten Küken mit Stuntingsyndrom kleine Viruspartikel mit einem Durchmesser von 19 bis 24 nm und einer buoyanten Dichte in CsCl von 1,43 g/ml nachgewiesen. Es wird vermutet, daß die viralen Partikel zu den *Parvoviridae* gehören. Ihre mögliche Rolle beim Stuntingsyndrom wird diskutiert.