

REOVIRUS INFECTION IN THE PIGEON

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Résumé

INFECTION PAR REOVIRUS CHEZ LE PIGEON. — Le pigeon est réceptif à l'infection par *Reovirus* puisqu'une souche a pu être isolée d'un pigeon malade et que 8 p. cent de pigeons pris au hasard possèdent des anticorps spécifiques.

La souche de *Reovirus* isolée semble peu pathogène pour le pigeon car l'inoculation expérimentale n'a pas entraîné l'apparition de symptômes malgré l'excrétion du virus dans les matières fécales.

Reovirus infection is widely spread in broiler chickens in Belgium (Meulemans *et al.*, 1980). McFerran *et al.*, (1976) reported isolation of *Reovirus* from pigeons.

As a strain of *Reovirus* has also been isolated in Belgium from a pigeon, we wanted to study the incidence of *Reovirus* infection in pigeons and the possible pathogenic role of *Reovirus* in this species.

Materials and Methods

1. Virus isolation

Virus was isolated from the liver of a pigeon

presenting hepatitis on autopsy and characterized as a *Reovirus* (strain 326 VB) by immunofluorescence (Meulemans *et al.*, 1980).

Bacteriological investigations remained negative.

2. Stock virus

Virus was multiplied twice on chicken embryo liver cell (CELC) cultures and harvested by suspending the cells in the supernatant medium when the cytopathogenic effect was generalized. The stock virus was stored at -70°C .

3. Experimental inoculation

Seven 5-week-old pigeons (no. 1 to 7) were

inoculated by oral route with 0.5 ml of the stock virus (day 0). Blood was taken from the birds before inoculation and 14 and 21 days after inoculation. Antibodies against *Reovirus* were searched for by counter-immunoelectro-osmophoresis (CIEOP).

The pharynx and the cloaca of pigeons 1 to 5 were swabbed before inoculation (day 0) and daily for 7 days after inoculation (days 1 to 7). The two remaining pigeons (no. 6 and 7) were killed on day 5 and their liver was taken for histopathological and virological investigations.

Haematoxylin-eosin stained liver sections were examined.

Swabs and triturated liver suspensions were assayed for viral isolation on CELC cultures according to previously described techniques (Vinde vogel *et al.*, 1980b; Vindevogel and Pastoret, 1981). Cultures giving negative results were assayed twice. Cultures where cytopathogenic effect appeared were examined by electron microscopy to confirm the presence of *Reovirus*.

4. Serological survey

Blood samples were taken from 75 carrier-pigeons of different origins, 3-month to 2-year-old. Antibodies were searched for by CIEOP.

5. CIEOP technique

The CIEOP technique used was as previously described by Vindevogel *et al.* (1980a) and Dagenais *et al.* (1981) according to the method of Middleton *et al.* (1976). Antigen was prepared with the S 1133 strain (Van der Heide and Kalbac, 1975). Specificity of the positive reactions was controlled using virus free antigen.

Results

1. Experimental inoculation

No antibodies were detected in the sera of the pigeons before and after inoculation.

Virus isolation from the pharyngeal swabs and the liver of experimentally infected pigeons failed but virus was isolated on CELC cultures from the cloacal swabs of 1, 3, 3, and 2 pigeons on days 2, 3, 4 and 5 respectively (table 1). Electron-microscopy of negative stained lysed cell culture preparations confirmed the presence of typical *Reovirus* (fig. 1).

No symptoms or macroscopic and microscopic hepatic lesions were observed.

2. Serological survey

Antibodies were detected in 6 out of 75 sera examined (8 p. cent).

Discussion

The pigeon is susceptible to *Reovirus* infection since the virus can be isolated from natural cases and is excreted in the faeces of experimentally infected animals; 8 p. cent of pigeons taken at random in Belgium possess precipitating specific antibodies. In Germany, Heffels *et al.* (1981) have found neutralizing antibodies against the same strain of avian *Reovirus* in 16 p. cent of pigeon sera. Since six avian *Reovirus* serotypes can be differentiated by neutralization, a technique such as CIEOP, able to detect group antigen, had to be used, even if less sensitive than neutralization

Table 1. — *Reovirus* experimental infection of pigeons

Presence of virus	Days							
	0	1	2	3	4	5	6	7
In the faeces	0/5	0/5	1/5	3/5	3/5	2/5	0/5	0/5
In the pharynx	0/5	0/5	0/5	0/5	0/5	0/5	0/5	0/5
In the liver	NT ^a	NT	NT	NT	NT	0/2	NT	NT

a: No tested

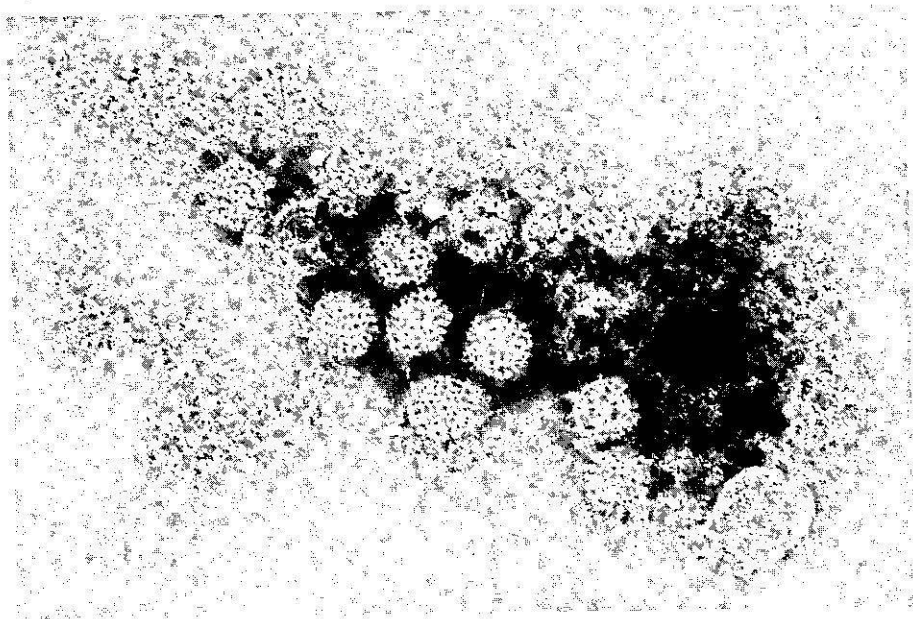


Fig. 1. — Typical Reovirus particles (EMI $\times 142\ 000$).

(Fritzsche *et al.*, 1981; Heffels *et al.*, 1981; Vindevogel *et al.*, 1980a). Therefore, the failure to detect specific antibodies in experimentally infected pigeons may either be due to the lack of sensitivity of the CIEOP technique or to a low viral multiplication.

Reovirus does not seem to be highly pathogenic for the pigeon in experimental conditions after inoculation by a natural route. Indeed, virus was shed without symptoms by experimentally infected birds. It should be interesting to try the pathogenicity of *Reovirus* when injected by a

parenteral route. However, in natural conditions, the pathogenicity of *Reovirus* may be different. Correlation between *Reovirus* infection and enteritis has been established in broilers (Meulemans *et al.*, 1980). Moreover, Meulemans *et al.* (1980) were able to reproduce mild diarrhoea in SPF chickens by oral inoculation of *Reovirus* and McFerran *et al.* (1976) isolated *Reovirus* from pigeons presenting diarrhoea.

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Summary

The pigeon is susceptible to *Reovirus* infection since a strain has been isolated from a sick pigeon and 8 p. cent of pigeons selected at random in Belgium possess specific antibodies. The strain of *Reovirus* isolated does not seem to be highly pathogenic for the pigeon as experimental inoculation resulted in the appearance of no symptoms except for excretion of the virus in faeces.

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