

## ネコ巨細胞形成ウイルス感染の血清疫学調査

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## Seroepizootiologic Survey of Feline Syncytial Virus Infections in Domestic Cats

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Foamy viruses are classified into *Spumavirinae*, a subfamily of *Retroviridae* which possesses an RNA-dependent DNA polymerase in the virion, and they have been found in several animal species including man, monkeys, cattle, cats, hamsters [3, 10], California sea lion (*Zalophus californianus*) [4], and some wild felids [5, 9]. They have been recovered primarily as contaminants of primary cell cultures since they induce persistent infection without evident pathogenesis in their natural hosts [3, 10]. In domestic cats, the foamy virus (feline syncytial virus: FSV) has not been thought to be involved in any of the illness except that its infection has been statistically linked to chronic progressive polyarthritis in which feline leukemia virus (FeLV) may play a direct role in the pathogenesis, or it may potentiate FSV infection by altering the host's normal immune reaction [8]. However, we have no information about the current incidence of FSV infection in the cat population in Japan. In this communication we describe the result of serologic analysis of cat serum by using a micro-immunodiffusion (MID) test of FSV. It has been reported that any cat with serum antibody is infected with the virus [1, 6].

The MID test was performed by the method described by Gaskin and Gillespie [1]. Feline syncytial virus S7801 strain recovered from the primary kidney cell culture of apparently healthy kitten [6] was applied as an antigen. The virus was cultivated in Crandell feline kidney (CRFK) cells and the MID antigen was prepared from the concentrated suspension of infected cells according to the methods described previously [1, 6]. After the MID slide was kept for 72 hr at room temperature in a humidified plastic chamber, the precipitin line was observed. The precipitin line formed against the virus antigen but not the normal CRFK cell antigen prepared by the same

manner was regarded as MID antibody-positive. All the cat serum samples were examined for FeLV by a commercial diagnostic test kit (Leukassay F\*; Pitman-Moore, Inc., Washington Crossing, NJ, USA) as well.

One hundred and eighty-two sera were collected from cats during 1982 to 1988 as presented in Table 1: 62 sera from clinically normal (healthy) cats, and 120 sera from diseased cats (FeLV infection, feline infectious peritonitis, depression, anorexia and pyrexia, halitosis and oral ulcerations, anemia, renal disorders, gastrointestinal signs, respiratory tract signs, and arthritis). The samples between 1982 to 1986 were submitted by veterinary surgeons in Kagoshima, Miyazaki, Tokyo, Saitama and Kanagawa areas for FeLV diagnosis, while most of the samples of the diseased cat group during 1987-1988 were collected from the cats consulting either teaching hospital of Kagoshima and Miyazaki Universities.

While only 3 cats out of 62 healthy cats were anti-FSV antibody-positive (4.8%), 18.3% of the diseased cats examined possessed the antibody in their sera as shown in Table 1. There was a statistically significant difference in the antibody-positive rate between the healthy and the diseased cat groups (at  $P < 0.05$  by  $\chi^2$ -test). No particular condition of illness was related to FSV infection. However, of 20 cats infected with FeLV, 9 cats (45.0%) showed mixed infection with FSV. In contrast, 16 cats (9.9%) out of 162 FeLV-uninfected cats were found to be infected with FSV, and this positive rate was significantly lower (at  $P < 0.01$ ) than that of the FeLV infected cats. The most possible explanation is that FeLV predisposes cats to be infected with FSV by its immunosuppressive effect. As a result the overall antibody-positive rate of the cat serum samples for the past 7 years was 13.7%. When compared to the incidence of FSV infection appeared in the previous report in Japan [6], there is no obvious difference in the healthy cat groups between the

Table 1. Detection of micro-immunodiffusion antibody against feline syncytial virus in cats

Year of collection	Healthy cats	Diseased cats <sup>a)</sup>	Total
1982	0/5	2/16 (12.5%) <sup>b)</sup>	2/21 (9.5%)
1983	0/5	1/9 (11.1%)	1/14 (7.1%)
1984	1/20 (5.0%)	2/22 (9.1%)	3/42 (7.1%)
1985	0/0	0/7	0/7
1986	1/18 (5.6%)	1/4 (25.0%)	2/22 (9.1%)
1987	0/7	7/29 (24.1%)	7/36 (19.4%)
1988	1/7 (14.3%)	9/33 (27.3%)	10/40 (25.0%)
Total	3/62 (4.8%)	22/120 (18.3%) <sup>c)</sup>	25/182 (13.7%)

a) See the text.

b) Number of cats with antibody/number of cats tested. Numbers in parentheses are the antibody-positive rate.

c) Significantly different from the healthy cat group (at  $P < 0.05$  by  $\chi^2$ -test).

present survey and the study conducted in Tokyo area a decade ago, but the overall antibody-positive rate obtained in the present study is about three times higher than that of the previous study. Although a much higher incidence of FSV infection in the general cat population was reported in the United States [7], significantly higher incidence of FSV infection (18.3%) in the diseased cat group in the present survey is an unexpected finding. At present FSV is believed not to be an important cause of proliferative nor nonneoplastic diseases of cats [7, 10]. However, the depression of cell-mediated immunity was observed in rabbits infected with simian foamy virus type 7 [2], and a foamy virus was isolated from the sea lion strongly suspected to be an immunosuppressive [4]. FSV may also have such an adverse effect in the persistently infected cats.

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## 要 約

ネコ巨細胞形成ウイルス感染の血清疫学調査（短報）：望月雅美・川路郁代・小川博之<sup>1)</sup>・阿久沢正夫<sup>2)</sup>（鹿児島大学農学部家畜微生物学講座，<sup>1)</sup>宮崎大学農学部家畜外科学講座，<sup>2)</sup>鹿児島大学農学部家畜内科学講座）——1982年から1988年にわたって収集した182例のネコ血清中の抗ネコ巨細胞形成ウイルス抗体を微量免疫拡散法で検査した結果，健康ネコ群が4.8%であったのに対し，疾病ネコ群は18.3%の有意差のある陽性率を示し，全体では13.7%の抗体陽性率（感染率）であった．ネコ白血病ウイルスとの混合感染ネコの割合が有意に高かった以外には，特別な疾病との関連は認められなかった．