

## Article

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## SEROEPIDEMIOLOGICAL AND ANATOMOPATHOLOGICAL INVESTIGATIONS ON FELINE PANLEUKOPENIA IN NORTHEASTERN ROMANIA

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### Abstract

The objectives of this study are as follows: to carry out seroepidemiological and hematological investigations on feline parvovirus infections in the north-eastern region of România and, on the other hand, to study the clinical and anatomopathological aspects in parvovirus infections in cats, following the prevalence of feline paleukopenia cases in the counties of Suceava, Botoșani, Iași and Vaslui, in România. To carry out the study, clinical examination, rapid commercial immunochromatography tests for the detection of panleukopenia virus antigen from feces, blood count and monitoring of cats infected with parvovirus in veterinary offices, as well as necropsy for deceased animals were used.

**Key words:** Feline panleukopenia virus, epidemiology, hematological results, feline parvovirus, symptoms

### Introduction.

Feline infectious panleukopenia, also known as "cat parvovirus", "infectious leukopenia of cats", "infectious gastroenteritis of cats", "typhus of cats", is an infectious-contagious disease, of virotic epidemic nature encountered in felines, clinically characterized by fever syndrome, serious digestive disorders, accompanied by leukopenia, anorexia, depression, prostration and anatomopathologically by catarrhal-hemorgic gastroenteritis lesions. (Perianu Tudor *et al.*, 2012).

According to the literature, the incubation period is 2-10 days, with an average of 4-6 days. The disease begins with a fever syndrome, accompanied by gastroenteric manifestations. Depending on how quickly and how seriously it evolves.

The symptomatology of the disease can be classified into four clinical forms: hyperacute, acute, subacute and atypical (Perianu Tudor *et al.*, 2012). The infection is widespread in many countries around the world, in Romania being first reported in 1933, when it evolved as a serious epizootic that caused the death of a large number of cats, especially in Bucharest. The importance of the disease lies in contagiousness, high percentage of morbidity and mortality. (Perianu Tudor *et al.*, 2012).

In this study 210 cats were considered that were presented in Veterinary Clinics and Practices in both urban and rural areas from the north-eastern region of România, more specifically, in Iași, Botoșani, Vaslui, Suceava counties, between 2021 and 2023 (*Table 1*).

Table 1

**Housing conditions and origin of cats with panleukopenia**

Housing conditions			Roosting			Origin		Total	
One-cat household	Multi-cat household	Animal shelter	Inner	Outside	Mixed	Rural area	Urban area		
No. of cases	38	94	78	49	52	109	161	49	210
%	18.09	44.76	37.14	23.33	24.76	51.90	76.66	23.33	100

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## MATERIAL AND METHOD

Material and method. In order to achieve the purpose of the paper, research methods commonly available in veterinary clinics and offices in counties in the north-eastern region of Romania were applied, comprising 210 cases of cats with suspected feline panleukopenia.

In order to clarify the suspicion of feline parvovirus infection, rapid commercial immunochromatographic tests for the detection of panleukopenia virus antigen in faeces were performed.

In order to evaluate the hematological parameters was used the URIT Medical Electronic CO analyzer.

Monitoring studies of clinical and anatomopathological signs were carried out in veterinary offices in Iași, Botoșani, Vaslui and Suceava counties.

The cases covered by the study included cats that had been diagnosed with panleukopenia, or suspected panleukopenia, who received medical care between 2021 and 2023.

## RESULTS AND DISCUSSIONS

Results and discussions. Out of the 210 animals diagnosed with feline parvovirus, 76.66% of them come from rural areas, being housed both outdoors and indoors, having a diet based mainly on wet food, cooked in households; 23.33% of them come from urban areas, being housed in apartments, isolated, the diet being based on dry food, alternated with wet food purchased from specialty stores, and 37.14% of cats come from stray animal shelters, which were abandoned beforehand, their health being degraded when they were found.

Out of 37.14% of abandoned felines, 66.66% were found outside the built-up areas, in places where they could not get food, water or shelter, and the other 33.33% were found in urban areas, near common public sanitation bins.

18.09% of cats come from single-cat households in both rural and urban areas.

Looking at the gender distribution, males were the most affected, at 55.23%, compared to females who accounted for 44.77% of all patients (*Table 2*).

Inconsistent with the literature (Prittie, 2004), 49.53% of cats over 12 months of age developed the disease during the assessed period, followed by cats younger than 6 months 29.53% (*Table 2*).

Table 2  
Age and sex categories of patients diagnosed with feline panleukopenia

sex		No. of cases	%
	male	116	55.23
female	94	44.77	
age	< 6 months	62	29.53
	6-12 months	30	14.28
	12-24 months	104	49.53
	>24 months	14	6.66

After performing the anamnesis and corroborating with the clinical signs specific to panleukopenia in the specialized literature, rapid tests for detecting the virus antigen in feces were performed, proved the concordance of the suspicion of disease with the test results, in 90% of cases, with positive results (*Table 2*).

In the remaining 10% of cases, the rapid test for parvovirus antigen was 71.42% negative, and 28.56% of the tests were false negative.

The symptoms of patients whose test result was negative, and the haematological examinations and data collected from the anamnesis, were similar to those described in the literature as specific to feline panleukopenia, were based on the consideration of intermittent elimination of the virus through faeces. For this reason, the diagnosis of Feline Panleukopenia has not been excluded, the animals following the appropriate treatment regimens (*Table 3*).

Table 3  
Results of rapid immunochromatographic tests for the detection of panleukopenia virus antigen in faeces

Total no. of samples	No. positive (%)	No. negative (%)	
210	90	10	
		No. negative (%)	No. false negative (%)
		71.42	28.58

From a hematological point of view, it was possible to perform the blood count in 42 of the patients (20% of the total number of analyzed cases), and the results were as follows: in 88% of the analyzed patients, there was a severe leukopenia with monocytopenia, neutropenia and polycythemia, considered aspects constantly encountered in the evolution of parvovirus, known to affect the bone marrow as well.

12% of haematological analyses performed on patients showed no parvovirus-specific changes, which could align on an early stage of the disease (*Table 4*).

Table 4

Results of haematological tests of patients with suspected feline panleukopenia		
		%
No. samples	42	100
No. patients with changed blood counts	37	88
No. Patients with unchanged blood counts	5	12

Cats from stray animal shelters that have previously abandoned have very different haematological test values, much lower than the values of cats also diagnosed with feline panleukopenia, but with the owner, although the age is similar.

The differences between the two categories of animals are represented by housing conditions, food administered and stressors to which cats have been exposed (Table 5).

Table 5

Age and lowest values of leukocytes revealed by haematological examination in stray cats and cats with owners

With owner		Without owner	
Age	No. Leukocytes /mm <sup>3</sup>	Age	No. Leukocytes /mm <sup>3</sup>
18 months	1500	12 months	450
16 months	4300	18 months	500
12 months	4500	18 months	550
24 months	6000	24 months	800
12 months	8000	12 months	1000

In terms of clinical manifestations, 95.23% of cats were confirmed with feline panleukopenia virus and showed symptoms specific to the disease and 4.77% of them showed mild symptoms of the disease, a state of apathy, without digestive symptoms or obvious hematological changes.

The symptoms that patients manifested included the following: apathy (92.85%), hyperthermia (85.71 %), ataxia (85.71%), polydipsia-however, animals refuse liquids, (77.61%); dehydration (80%), vomiting (92.85%), diarrhea (85.71%) (Figure 1), tonic muscle contractions (1.9 %), aggression (1.9%) and epileptiform seizures (1.9%) (Table 6).

Table 6

The main symptoms present in the studied cats		
Symptoms	No. of cats	%
Apathy	195	92.85
Hyperthermia	180	85.71
Ataxia	180	85.71
Polydipsia	163	77.61
Dehydration	168	80
Vomiting	195	92.85
Diarrhea	177	84.28
Tonic muscle contractions	4	1.9
Aggressivity	4	1.9
Epileptiform seizures	4	1.9



Figure 1 - Clinical aspects - cat with diarrhea with yellowish liquid content

Regarding the results of the performed necropsies, the macroscopic anatomopathological lesions observed are those specific to dehydration and anemia, with the mention that in rehydrated animals edema and drops can be detected due to hypoproteinemia, it was found at the general examination of corpses that all animals were dehydrated, without bodily lesions, conjunctival mucous membranes, pale mouth, pearl color.

The lesions that drew attention when analyzing the corpses were the characteristic lesions that occur in the ileum and jejunum that are relaxed, cherry-red in color, the mucosa being infiltrated, congested, with fibrinous deposits and ulcers, and these lesions were observable in 4 corpses (figure 2),

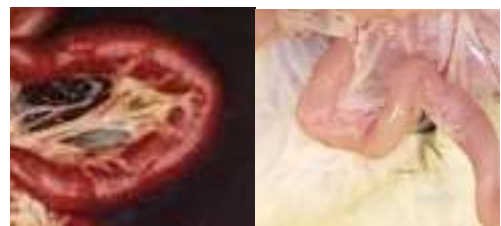


Figure 2 Macroscopic aspects of the small intestine in cats, Left: Inflamed gut loops, Right: normal appearance

## CONCLUSIONS

The epidemiological, hematological, and serological data recorded are matched by those extracted from the literature, so in all the years studied, males were most frequently diagnosed with panleukopenia, compared to females, but, regarding the age at which the disease usually evolves, it was found that most clinical forms were observed in cats aged 12-24 months. This may be due to the origin of cats, most of which come from stray animal shelters after being abandoned in various out-of-town areas.

Poor weather conditions, homelessness and poor feeding conditions have led to decreased immunity of these felines, making them more susceptible to various pathogens, including feline panleukopenia virus.

A definitive diagnosis of feline panleukopenia should be based on the corroboration of all epidemiological, haematological, serological, clinical and anatomopathological aspects, not on the confirmation of a single aspect mentioned above, specific to this disease or a single test.

#### REFERENCES

- Addie D. D., Toth S., Thompson H., Greenwood N., Jarrett J. O., 1998** - *Detection of feline parvovirus in dying pedigree kittens*. Vet Rec,142 (14):353–356;
- Al-Bayati HAM., 2016** - *Detection of feline parvovirus (FPV) from cats infected with enteritis using rapid test and polymerase chain reaction in Iraq*. Kufa J Vet Med Sci.;7(2):61-70;
- Alleice S., 2014** - *Feline panleukopenia (feline distemper): Common diseases of companion animals*. 3rd ed. St. Louis: Elsevier Health Sciences Division;163-164;
- Battilani, M., Balboni, A., Ustulin, M., Giunti, M., Scagliarini, A., Prospero, S., 2011**- *Genetic complexity and multiple infections with more parvovirus species in naturally infected cats*. Vet Res 42, 43–52;
- Perianu Tudor et al., 2012** – *Tratat de boli infecțioase ale animalelor, Viroze*. Universitas XXI, Vol II. Iași.
- Kruse BD, Unterer S, Horlacher K, et al., 2010** - *Prognostic factors in cats with feline panleukopenia*. J Vet Intern Med; 24:1271–1276.