Study of *Dermanyssus gallinae* infestation prevalence in poultry, from three localities in Cluj county

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**SUMMARY**

The researches performed during year 2008 (January-October), in poultry from 60 households, coming from 3 localities, Cluj county, Romania. The results have shown a high extensivity of *Dermanyssus gallinae* infestation during the summer: 95% in Apahida; 65% in Ocna-Dej and 75% in Floresti. The lowest values of the prevalence were found in the cold season of winter: 35% in Apahida; 10% in Ocna-Dej and 15% in Floresti.

**Key words:** epidemiology, study, *Dermanyssus*, poultry, Cluj.

**Introduction**

*Dermanyssus gallinae* currently is the most important ectoparasite affecting egg layers in several countries. To a lesser degree, it also affects hens and roosters used to provide hatching eggs for broiler production. This mite may feed on the blood of a lot of birds (poultry, game birds, aviary birds and wild birds) (Chauve, 1998; Beugnet et al, 1997). This blood-feeding pest causes production losses due to irritation and anaemia and may even cause death of its host (Chirico and Tauson, 2002). *D. gallinae* is an ectoparasite with high extensivity in private households, but attacks with severe consequences can also outbreak in intensive breeding units (Șuteu and Cozma, 2004). Besides poultry, it could attack mammals too, producing pruritus, depilations and otitis (Șuteu and Dulceanu, 2001). In other regions of the world, *Ornithonyssus sylviarum* and *Ornithonyssus bursa*, have a higher prevalence (Kilpinen, 2000). Generaly, the presence of these mites was mentioned in the countries with high egg and poultry meat production and large amounts of time, labour and money are invested to control this blood-feeding pest (Dernburg et al., 2002). The mites inhabit cracks and crevices in the poultry house for most part of their lives, and just encounter the birds for short blood-meals, mainly at night (Hearle, 1938; Kirkwood, 1968). Occasionally, *D. gallinae* causes dermatitis and a nuisance to people working at heavily infested poultry houses (Kim et al., 2004).

The aim of this study was to establish the prevalence of *D. gallinae* infestation in poultry from private households, in three localities from Cluj county, during all seasons.

**Material and methods**

The researches performed during January-October 2008, in poultry from 60 private households, from 3 localities, Cluj county: Apahida, Ocna-Dej and Florești. In the study were taken young and adult birds. From each locality were inspected 20 households. The presence of the ectoparasites was revealed by inspections of their likely hiding and breeding places.
The suspect material was collected from the bird shelters using a brush on a white sheet of paper and examination after light exposure. The mites were identified based on the morphological aspects under microscope, on the Department of Parasitic Diseases at the Faculty of Veterinary Medicine from Cluj-Napoca. The prevalence of the infestation was determined.

**Results and discussions**

The results regarding the prevalence of *D. gallinae* infestation in poultry, during the four seasons of the year 2008, in the 3 localities taken in study, are shown the figures 1-4.

![Fig. 1](image1.png)

**Fig. 1.** The prevalence of *Dermanyssus gallinae* infestation in the three localities during the winter season

![Fig. 2](image2.png)

**Fig. 2.** The prevalence of *Dermanyssus gallinae* infestation in the three localities during the spring season.
Following the data from the figures 1-4, we could see in all the three localities the higher prevalence of *D. gallinae* infestation (65-95%) in the summer. Under favourable conditions, during the warm season, when the temperatures are high, the life cycle of the parasite can be completed within 1 week, and a high reproduction rate may occur as the feeding-oviposition cycle repeats about every third day and large populations can be rapidly established (Desch, 1984). Many times during the summer season, when the infestation is high, the owner of the birds noted each morning many “red moving spots” on the door of the coops. The birds are attacked mainly at night, when nymphs and adults feed. Hence, most of it’s life cycle is spent off the host in cracks and crevices in roosting and nesting sites (Nordenfors et al, 1999; Meyer-Kuhling et al, 2007). Maurer and Baumgart (1992) shown that the most favorable temperatures for juvenile development of *D. gallinae* ranges between 25 and 37°C. *D. gallinae* is found worldwide, it seems attracted to heat, which may explain the season during which the bigger infestations were observed in the temperate climate. The lowest values of the prevalence (10-35%) were found in the cold season of winter, when the temperature isn’t favorable for the developing of the evolutive cycle (fig. 5).
in the spring the prevalence of *D. gallinae* infestation was: 45% in Apahida; 15% in Ocna-Dej, 20% in Floresti, and in the autumn the prevalence of infestation was: 75% in Apahida; 40% in Ocna-Dej and 45% in Floresti.

The mite is able to survive for a long time (8 months) in an empty chicken hut during natural conditions without feeding on blood, with temperatures ranging from -10 to +27°C., and the disease can persist for several years (Kirkwood, 1968; Auger et al, 1979). Nordenfors et al (1999) reports in a study, the capacity of *D. gallinae* to survive for 9 months at 5°C. Due to this behaviour it can be very difficult to reach all the mites with chemical control agents, and it’s not possible to starve the mites to death between flock replacements. In combination with enormous reproductive potential this causes serious control problems in egg production systems (Kilpinen, 2000). Knowledge of mite development and survival during specific abiotic conditions provides useful information for the understanding of their populational dynamics.

As a result of traps placed for finding *D. gallinae* in poultry from alternative system in Sweden, Nordenfors et al\(^1\) (1999) established a prevalence of the infestation of 67%. In Denmark, Kilpinen (2000) established a prevalence of *D. gallinae* attack of 68% in „free-range” poultry breeding system. In France, the prevalence of infestation was 74.7%, in the poultry organic range system (Bruneau et al., 2001), and in Poland a prevalence of 100% in poultry breedings (Cencek, 2002). Mitsiadi et al, in 2003, after a study made in turkeys, established a prevalence of *D. gallinae* infestation of 17.1%. According to Şuteu (1996) the prevalence of *D. gallinae* infestation in birds could vary between 30-70%, depending on breeding system.

\(D. gallinae\) prefers the blood of birds, but in their absence will feed on the blood of humans and other mammals, however the mite cannot continue to live and reproduce on the human host (Auger et al, 1979). In the humans could cause a severe pruritic macular, popular, vesicular or urticarial rush, which sometimes persist for several days (Rosen et al, 2002). In birds the infestation can stunt growth, cause underproduction of eggs or even kill the host. Another factor which must be taken in consideration is the capacity of the mites to act as vector and reservoir for a number of diseases (Kilpinen, 2000).This haematophagous mite has the peculiarity of feeding rapidly on the blood of its host and it can survive long periods of fasting. This blood-sucking behaviour explains the potential of this mite to transmit pathogenic agents. They can be vectors of/and reservoir for various pathogens including *Salmonella, Pasteurella, Coxiella*, avian spirochetes, chicken pox virus, as well as disease agents of other livestock species: viruses of Eastern and Western equine encephalomyelitis and St. Luis encephalitis (Regan et al, 1987; Nordenfors et al, 1999\(^1\); Valiente et al, 2007).

**Conclusions**

The studies performed between January and October 2008 on 60 private households, in three localities from Cluj county, revealed the following:

- The infestation with *D. gallinae* was found at the birds from households in the three localities from Cluj county in all seasons during the study;
• A high extensivity of *D. gallinae* infestation was found during the summer: 95% in Apahida; 65% in Ocna-Dej and 75% in Floresti;

• The lowest values of the prevalence were found in the cold season of winter: 35% in Apahida; 10% in Ocna-Dej and 15% in Floresti;

• In the spring the prevalence of *D.gallinae* infestation was: 45% in Apahida; 15% in Ocna-Dej and 20% in Floresti;

• In the autumn the prevalence of *D.gallinae* infestation was: 75% in Apahida; 40% in Ocna-Dej and 45% in Floresti.

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