EPIDEMILOGIC STUDY OF *DERMANYSSUS GALLINAE* (*ACARI:DERMANYSSIDAE*) INFESTATION IN BIRDS, FROM THREE LOCALITIES ON CLUJ AREA

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**Abstract.** The researches were made during June 2005-April 2006, on birds from extensive system, from 3 locations on Cluj county: Apahida (location 1), Ocna-Dej (location 2) and Florești (location 3), adult and young birds were examined. In each locality were examined systematically in each season, 20 private yards. The medium prevalence of *D. gallinae* infestation, during one year, had the biggest value in the locality Apahida (72.5 %), in Ocna-Dej was 61.25 %, and in Floresti the prevalence was 57.5 %. From the collected mites were isolated *E.coli, B. cereus, Pseudomonas spp.*, *Staphylococcus spp.*, *Streptococcus spp.*, *Micrococcus spp.* and *Corynebacterium spp.*

**INTRODUCTION**

Dermatitis, toxicosis is an ectoparasitosis of domestic and wild birds, producing low symptoms, pruritic, or as a severe anemic and toxic syndrome, emaciation and mortality in young and adult poultry, determined by species of *Dermamyssus* genre. The incidence is big in private yards, but also the attack with grave consequences in intensive systems was semnalated (Șuteu și Cozma, 2004). *Dermamyssus* ticks, excepting birds, can also attack the mammals, producing pruritus, depilations or otitis (Șuteu și Dulceanu, 2001). The importance of *D. gallinae* infestation is well known in Europe, especially because of pathogenic effects on layers (Chauve, 1998). In some of the European countries, *D. gallinae* is the most important ectoparasite of the layers (Beugnet et al, 1997). Generally, the presence of these mites, was semnalated in the countries with big production of poultry egg and meat (Dernburg et al, 2002).

**MATERIAL AND METHOD**

The researches were made during June 2005-April 2006, on birds from extensive system, from 3 locations on Cluj county: Apahida (location 1), Ocna-Dej (location 2) and Florești (location 3), adult and young birds were examined. In each locality were examined sistematicaly in each season, 20 private yards. The presence of the ectoparasites was revealed after the collection of suspect material from the bird shelters, on a white sheet of paper and examination after light exposure. If the samples were positive, the material was introduced in plastic recipients, in order to be studied later at with a binocular glass (4x) and microscope (10x).

As a result of the investigations, the extensivity of *D. gallinae* infestation in 3 localities from Cluj county was established.
To put in evidence the potential of vector role of *Dermanyssus* ticks, were made inoculation of specific culture media for bacteria. To reveal the bacteriums from the ticks cuticle, were made washings with sterile physiological solution. In order to demonstrate possible internal carriage of the bacteriums, the mites were placed in a Petri dish containing ethanol 70% for 60 sec to allow the surface sterilisation, and then transferred on a sterile filter paper to dry. Subsequently the mites were squashed in a mortar with physiological solution and transferred on culture mediums.

**RESULTS AND DISCUSSIONS**

After the recollection of mite’s piles from biotops, the material was examined at microscope (ob. X10), and were identified all the evolutive stages of the ticks. The results concerning the extensivity of *Dermanyssus gallinae* infestation in birds, in the 3 localities, according to the season, are presented in the graphics 1, 2, 3 and 4.

During the season of spring, in the 3 localities taken in our study, the prevalence of *D. gallinae* infestation had maximum value in the locality 1 with 60%, in the locality 2 - 55% and in locality 3 the value of extensivity was 40% (fig. 1).

During the season of summer, the values of prevalence were big, in direct correlation with meteo conditions (temperature and humidity), the maximum value being recorded in the localities 1 and 2 (90%) and for the locality 3, the value of prevalence was 80% (fig. 2).

**Fig. 1 - The prevalence of *D. gallinae* infestation in the 3 localities, in the spring**

**Fig. 2 - The prevalence of *D. gallinae* infestation in the 3 localities, in the summer**

**Fig. 3 - The prevalence of *D. gallinae* infestation in the 3 localities, in the autumn**

**Fig. 4 - The prevalence of *D. gallinae* infestation in the 3 localities, in the winter**
The biggest value of the *Dermanyssus* infestation’s prevalence during the season of autumn was recorded on the locality 1 (90%), the smallest value of the prevalence was recorded in the locality 2 (70%), and in the locality 3 the prevalence was 80% (fig. 3).

In the fig. 4, is shown the infestation’s prevalence during the winter season, with smaller values, because of low temperatures of the environment, which are not favourable for *Dermanyssus* ticks. In the locality 1, the prevalence of infestation was 50%, in the locality 3 the prevalence of infestation was 40%, and the smaller value was recorded in the locality 2 (25%).

![Fig 5: The prevalence of *D. gallinae* infestation in the locality 1 during the 4 seasons](image1)

In the locality 1, the biggest values of the prevalence were recorded in the seasons of summer and autumn, (90%), the smallest value was recorded during the winter (50%), and in the spring the value of the prevalence was 60% (fig. 5).

In the locality 2, the biggest value of the prevalence was recorded in the summer season - 90%, in the autumn the prevalence was 80%, in the spring the value of prevalence was 50%, and in the winter season were recorded the lowest prevalence of the infestation - 25% (fig. 6).

![Fig 6: The prevalence of *D. gallinae* infestation in the locality 2 during the 4 seasons](image2)

In the third locality, the prevalence of *D. gallinae* infestation, had big values during the summer (80%) and the autumn (70%), in the spring and winter seasons the values were the same - 40% (fig. 7).

![Fig 7: The prevalence of *D. gallinae* infestation in the locality 3 during the 4 seasons](image3)

In the third locality, the prevalence of *D. gallinae* infestation, had big values during the summer (80%) and the autumn (70%), in the spring and winter seasons the values were the same - 40% (fig. 7).

![Fig 8: The medium prevalence of *D. gallinae* infestation during 1 year](image4)
The medium prevalence of *D. gallinae* infestation during 1 year, had the biggest value on the 1-st locality (72.5%), in the 2-nd locality had a value of 61.25%, and in the 3-rd locality, the medium prevalence was 57.5% (fig. 8).

The medium prevalence of *D. gallinae* infestation during 1 year, had the maximal value in the summer season (86.6%), while in the autumn season it decreased slowly at 80%. In the spring, the medium prevalence for all the 3 localities from our study, had a value of 50%, and in winter season was recordere the lowest value (38.3%) (fig. 9).

Poultry production systems oppose two extremes: the organised industrial system and the traditional or backyard flock. *D. gallinae*, can be found in all types of housing systems (deep litter and aviary, organic free-range, or conventional battery systems), it resides on the host only during the blood meal, at night, and hides in the cracks of the poultry house during the day (Bruneau et al, 2000). Very favourable are the housing from extensive systems, where they are made from wood, brick, earthen, etc. The mites occur in both battery cage and floor systems. However, the problem is more common and widespread in the latter, probably attributed to the presence of numerous suitable hiding places for the mites in most floor systems (Chirico J. et al, 2001). The life cycle can be completed in as little as seven days, so the mite populations can expand rapidly, colonies with eggs, larvs, ninfhs and adults can be found in the crevices of the house holding. This kind of situations are reported during the summer season, when the temperature maintain over 20°C during many days and nights (Cosoroabă, 2001).

In Denmark, Kilpinen report the occurrence of chicken mite high as 68% in free-range systems and even in battery systems around one of third of the producers report the presence of chicken mite (Kilpinen, 2000). In France, Bruneau et al. establish a prevalence of *D. gallinae* infestation as 74.7%, in the layers for ecologic eggs (Bruneau et al, 2001), in Poland Cencek has found the presence of the parasite in 100% from layers farms examined, by inspection of their likely hiding and breeding places (Cencek, 2002). After Şuteu (1996) the prevalence of *D. gallinae* infestation can vary between 30-70%, according to the breeding system.

As a result of the microbiological exams on bacterial growth media were identified bacterial strains shown in table 1.
Table 1 – The bacteriums isolated from *D. gallinae* collected from the three localities

<table>
<thead>
<tr>
<th>Locality</th>
<th>Bacteriums found on the cuticle</th>
<th>Bacteriums found inside</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apahida</td>
<td><em>E. coli</em>&lt;br&gt; <em>Pseudomonas spp.</em>&lt;br&gt; <em>B. cereus</em>&lt;br&gt; <em>Corynebacterium spp.</em>&lt;br&gt; <em>Staphylococcus spp.</em></td>
<td><em>Staphilococcus spp.</em>&lt;br&gt; <em>B. cereus</em>&lt;br&gt; <em>E. coli</em></td>
</tr>
<tr>
<td>Ocna Dej</td>
<td><em>Staphylococcus spp.</em>&lt;br&gt; <em>E. coli</em></td>
<td><em>B. cereus</em></td>
</tr>
<tr>
<td>Floresti</td>
<td><em>Micrococcus spp.</em>&lt;br&gt; <em>B. cereus</em></td>
<td><em>Staphylococcus spp.</em>&lt;br&gt; <em>Streptococcus spp.</em></td>
</tr>
</tbody>
</table>

The bacteria isolated in our study make part from conditioned pathogens, which can produce when the birds are kept in not favourable conditions, different cutaneous diseases, or even septicemia. *D. gallinae* can have a vector role for *Borelia anserina*, *Treponema*, *Yersinia*, and even for *Pasteurella multocida*. Zeman (1988) shown that *D. gallinae* keep viable in his body *Salmonella gallinarum* for at least 4 months. *D. gallinae* can transmit some viruses, like *Saint-Louis Encephalitis*, *West Encephalitis de Vest*, some arboviruses, but his role in the transmission of these diseases is low. Kovalen consider that the mites can be involved in the evolution of avian tuberculosis and micoplasmosis. In a study made by Chirico et al, *Erysipelothrix rhusiopathiae* was isolated for the first time, from naturally infected *D. gallinae*, collected on three farms where erysipelas was diagnosed in the hens. The results imply that the mite is a potential vector for this bacterium (Chirico et al, 2003). The erysipelas is an infectious disease, sporadic or enzootic, which may affect many species of mamals, especially pigs, but also wild and domestic birds (Vasiu, 2001).

**CONCLUSIONS**

The researches made during June 2005-April 2006, on birds from extensive system, from 3 locations on Cluj county, revealed the next:

- The medium prevalence of *D. gallinae* infestation, during one year, had the biggest value in the locality Apahida (72,5 %), in Ocna-Dej was 61,25 %, and in Floresti the prevalence was 57,5 %;
- The maximal value of the infestation’s prevalence was during the summer season (86,6%), and the minimal value in the winter season (38,3%); in the autumn the prevalence was 80 %, and in the spring 50 %.
- The bacteriums isolated from the mite’s cuticle were: *E. coli*, *Pseudomonas spp.*, *B. cereus*, *Staphylococcus spp.*, *Micrococcus spp.*, *Corynebacterium spp.* and from internal: *E. coli*, *B. cereus*, *Staphylococcus spp.*, *Streptococcus spp.*, all these bacteriums belong to oportunistics pathogens.

**BIBLIOGRAPHY**

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