Control of poultry red mite (\textit{Dermanyssus gallinae}) – P 547/17, preliminary report

Pavlicevic A., Ratajac R., Milica Dotlic, Igor S., Pavlovic I.

AVES MIT" DOO, Subotica-Bajmok, Cluster "Dermanyssus gallinae", Serbia
Scientific veterinary institute „Novi Sad“, Novi Sad, Serbia
Scientific veterinary institute of Serbia, Belgrade, Serbia
Introduction

Poultry red mite *Dermanyssus gallinae* (De Geer, 1778), is the dominant ectoparasite in poultry rearing.

This invasive species is a temporary, haematophagous parasite. The biological characteristics of *D. gallinae*, environmental and technological conditions in poultry rearing, and especially the incorrect approach to control, have all contributed to making it one of the greatest health and economic problems of poultry keeping.
The control of *D. gallinae* is dominantly based on synthetic neurotoxic compounds (insecticides, acaricides).

The results of such an intensive practice in *D. gallinae* control across several decades are high prevalence, health and economic damages.
The uncritical control of *D. gallinae* presents a toxicological risk for consumers, staff, poultry and the environment.
The innovative formulation from 2017, P547/17, based on inert oils, has offered a new approach to *D. gallinae* control, through a physical mode of action.

P547/17 is applied in thoroughly cleaned, washed disinfected and dried production facility, by spray method, in the form of a 15-20% emulsion.
Aim

Assessing the justification for the application of the innovative formulation P 547/17 in *D. gallinae* control.
Materials and methods

• Laboratory examination of efficacy on *D. gallinae* has been conducted by Petri cup and tin boxes method.

• Clinical examination, upon the completion of professional application, has been conducted through monthly monitoring, early detection method and visual check-ups.
### Results

1. Tabular display of laboratory examinations selection.

<table>
<thead>
<tr>
<th>Number</th>
<th>Water emulsion percentage</th>
<th>Surface</th>
<th>Exposure</th>
<th>Residual effect</th>
<th>Efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.00% P</td>
<td>P</td>
<td>1 min.</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>1 P</td>
<td>P</td>
<td>1 hr.</td>
<td>0</td>
<td>98</td>
</tr>
<tr>
<td>3</td>
<td>1 M</td>
<td>M</td>
<td>1 hr.</td>
<td>0</td>
<td>29</td>
</tr>
<tr>
<td>4</td>
<td>15 M</td>
<td>M</td>
<td>1 hr.</td>
<td>0</td>
<td>97</td>
</tr>
<tr>
<td>5</td>
<td>15 M</td>
<td>M</td>
<td>1 hr.</td>
<td>4</td>
<td>87</td>
</tr>
<tr>
<td>6</td>
<td>15 M</td>
<td>M</td>
<td>1 hr.</td>
<td>8</td>
<td>96</td>
</tr>
<tr>
<td>7</td>
<td>20 M</td>
<td>M</td>
<td>1 hr.</td>
<td>4</td>
<td>100</td>
</tr>
<tr>
<td>8</td>
<td>20 M</td>
<td>M</td>
<td>1 hr.</td>
<td>8</td>
<td>100(a)</td>
</tr>
</tbody>
</table>

Key:
- 1 minute exposure, full direct exposure.
- 1 hour exposure, subsequent exposure
- P-plastic surface
- M- galvanized sheet metal surface

a) In some cases recording the residual effect between 4 and 8 months, shows minor deviations from 100% efficacy
2. Tabular display of clinical examination example.

<table>
<thead>
<tr>
<th>Number</th>
<th>Capacity</th>
<th>Exploitation period</th>
<th>Finding</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>18000</td>
<td>3 months</td>
<td>1 (a) v</td>
</tr>
<tr>
<td>2</td>
<td>28000</td>
<td>3,5 months</td>
<td>1 (b) v</td>
</tr>
<tr>
<td>3</td>
<td>25000</td>
<td>7 months</td>
<td>1 d</td>
</tr>
<tr>
<td>4</td>
<td>45000</td>
<td>8 months</td>
<td>1 d</td>
</tr>
<tr>
<td>5</td>
<td>2000</td>
<td>9 months</td>
<td>0 (c) d</td>
</tr>
<tr>
<td>6</td>
<td>4500</td>
<td>9 months</td>
<td>0 (c) d</td>
</tr>
<tr>
<td>7</td>
<td>19000</td>
<td>7 months</td>
<td>0 (c) d</td>
</tr>
<tr>
<td>8</td>
<td>50000</td>
<td>5,5 months</td>
<td>0 (c) d</td>
</tr>
</tbody>
</table>

Key:
a) Hygienically unconditioned, rest period shorter than 7 days;
b) Greasy residues after washing;
c) Optimized procedure;
v) Visual detection;
d) Dust detection;
Discussion

Safety

P 547/17 is a nontoxic formulation, of filtered paraffin oil and silicon oil.

Apart from the harmlessness of the formulation, safety is further insured by the application technology, application in the preparation of empty facilities.
Formulation P 547/17 is highly efficient with directly exposed *D. gallinae* specimens.
The prolonged effect is extremely pronounced. On nonabsorbent surfaces, with a 1 hour exposure, it is 100% over a four months period, and it is continued in a lesser extent after this period for a very long time.
It does not have a significant effect of *D. gallinae* eggs. However, due to its lasting prolonged effect, this deficiency has no practical importance.
Laboratory examination confirms that P547/17 has the necessary characteristics for efficient *D. gallinae* control.
Results in practical conditions also prove this.
The application technology allows for great applicability and machine application. Application can be done by professional services, but also by the farmers.
The program approach ensures the integrity of measures and procedure, a condition for a lasting success in *D. gallinae* control.

The correct use of P547/17 ensures a high level of suppression, and has the potential for eradicating *D. gallinae* from production facilities or farms.
Deficiencies:

1. Requires maintaining hygienic conditions, which requires additional effort.
2. Before application, in empty facilities, cleanliness is required, and also, if present, the removal of SiO2 and greasy residues.
3. In case of slipping, lime or diatomaceous earth should be applied to the inner side of belt pulleys.
The application of P547/17 on nonabsorbent surfaces (floor) has to be repeated due to the absence of a prolonged effect.

Downtime of a prepared facility before flock housing, in temperature conditions for *D. gallinea* activity, significantly contributes to efficacy. The expected efficacy of a properly applied formulation, with rest period of 14 days is the highest suppression level (10-12 months), and with rest period of 30 days, eradication from production facilities.
Thank you for your attention!

All photographs are originals (M. Bokorov, M. Zekovic, A. Pavlicevic), and part of the photo documentation and property of the cluster Dermanyssus gallinae, Serbia.