Innovative formulation of paraffin and silicone oils for control of poultry red mite (*Dermanyssus gallinae*) – 2. comparative laboratory efficacy examinations with active matter SiO2

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
The control of the most important poultry ectoparasite, poultry red mite *Dermanyssus gallinae* (De Geer, 1778), has certain deficiencies which enable high prevalence, health and economic damages, but also a significant toxicological risk.
• The toxicological risk may be eliminated through physical control: temperature, light and inert substances. Of these, inert substances have the greatest practical importance.
**Aim**

- Comparing the efficacy on poultry red mite (*Dermanyssus gallinae*) of paraffin and silicone oils formulation (P 547/17) and SiO2 formulations in laboratory conditions.
Materials and methods

• The biological test has been conducted on adult laboratory specimens of *D. gallinae*, fed females. Laboratory examinations of efficacy on *D. gallinae* has been conducted by Petri cup and tin boxes method.

• Types of tests
  • 1. direct, full exposure 1 minute.
  • 2. indirect exposure 1 hour.
  • 3. indirect exposure 24 hours.
Results
1. Graphical display of the efficacy of 20 different types of powder SiO2 formulations, at full direct exposure, 1 minute exposure, over the 5 subsequent days observation period.
2. Graphical display of the efficacy of 20 different types of powder SiO2 formulations, at subsequent exposure, and 1 hour exposure, over the 5 subsequent days observation period.
3. Graphical display of the efficacy of 10 different types of powder SiO2 formulations, for application in water suspension, at full direct exposure, at 1 minute exposure, over the 5 subsequent days observation period.
4. Graphical display of the efficacy of 10 different types of powder SiO2 formulations, for application in a water suspension, at subsequent exposure, at 1 hour exposure, over the 5 subsequent days observation period.
5. Graphical display example of comparative efficacy examinations of powder and liquid forms of SiO2 form.
6. Graphical display of efficacy, example of SiO2 formulations from the selection of ones for liquid form application, at 1 minute, 1 hour, 24 hours exposures, and 1 hour after 60 days residual effect. At one hour exposure at the end of the tenth day of the test, 35 protonymph have been recorded.
7. Graphical display of efficacy of 2% water emulsion of P 547/17 formulation on plastic and galvanized tin surface.
8. Graphical display of (10) 20% water emulsion of P 547/17 formulation, at 1 minute, 1 hour, 24 hours exposure and 1 hour after 60 days residual effect.
Discussion

- Formulations with active matter SiO$_2$ differ from one to another, and vary between inefficient to efficient.
• This is why it is recommended that the selection of SiO2 formulations should not be arbitrary, but based on examined biological efficacy.

• In the tests conducted the powder form of SiO2 formulations is more efficient than the liquid one.
• The most efficient SiO2 formulations, with subsequent exposure lasting 1 hour can lead to a 100% mortality in the period of 3 days.

• The residual effect is significantly preserved (80%) after 2 months.
• Reproduction even of lethally exposed mites is preserved, which significantly decreases the estimation of the overall efficacy of SiO2 formulations.

• Water emulsion P 547/17 does not significantly influence the stadium and laying of eggs, but this is compensated for through the prolonged effect.
The residual effect of the P547/17 formulation depends on the surface. It is manifested on nonabsorbent surfaces at different rates for plastic and metal surface. The concentration of 20% water emulsion optimizes application.
Water emulsion of the P 547/17 formulation in 20% concentration exhibits a 100% efficacy for *D. gallinae* at direct (1 min.) and subsequent (1 hour) exposure, and a residual effect over 60 days.
Conclusion

• Results of laboratory examinations point to a high potential of the selected SiO2 products and oil formulation P 547/17 in D. galliane control.
• The clinical examination will complete their profile and provide a final estimation.
Thank you for your attention!

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